

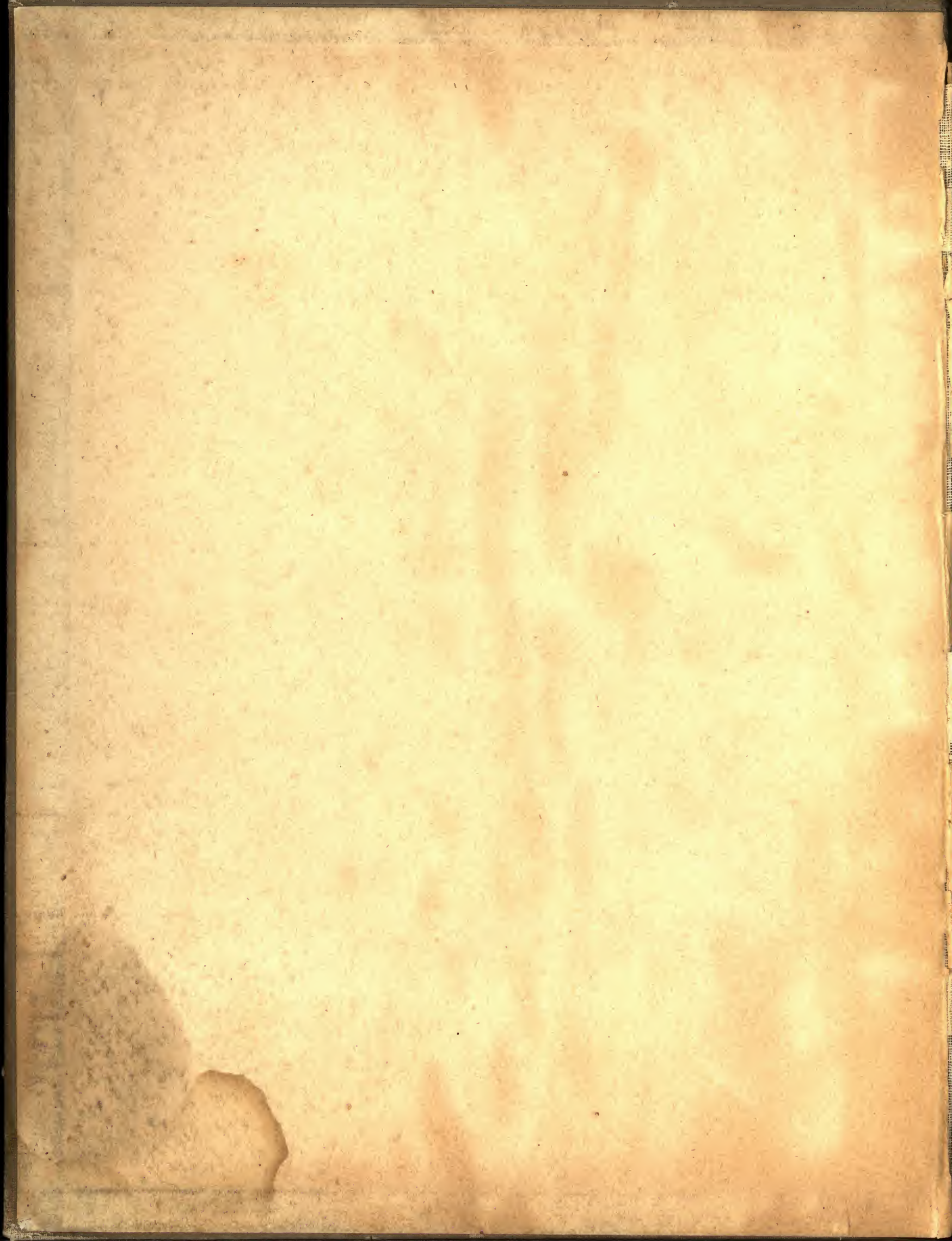
BUILDING AND ENGINEERING

CATALOGUE

1922
EDITION

DATA
SPECIFICATION
DATA

SPECIFICATION DATA LIMITED
DOMINION BANK BUILDING
TORONTO CANADA



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Grouped Catalogue of Building and Engineering Equipment



1922

Indexed According to Trades

Devised, Compiled and Edited by


Specification Data, Limited

Head Office: - Dominion Bank Building

Toronto, Canada

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SPECIFICATION DATA, LIMITED

INTRODUCTION

N publishing the eleventh edition of "**Specification Data**" Building and Engineering Catalogue, now so extensively known throughout the Architectural, Engineering and Building communities of Canada, the publishers feel they have succeeded in creating a medium whereby the person who purchases building or engineering equipment may have constantly before him that vital information which is so essential to him at the time he most requires it.

The advertisements contained herein are drawn up in a purely technical manner, accompanied in many instances by detailed drawings giving sections of the materials advertised or showing the accepted method of installation.

While "**Specification Data**" does not contain information relating to every known product, the data submitted is nevertheless very comprehensive. Information relating to a certain product not listed herein can be obtained promptly, simply by writing out one of the information postcards and mailing same to the publishers. Users of this volume are cordially invited to make use of the Service Department, which is devised solely for the benefit and free use of users of "**Specification Data**" and advertisers therein.

Standard Specifications on Sewer Construction and Roadways will be found in the front pages, and it is hoped these will prove beneficial to Municipal Engineers.

Users of this volume are cordially invited to make criticisms and suggestions, as it is only by receiving such criticisms and suggestions that the publishers can produce a volume generally acceptable to its many users.

EDITOR.

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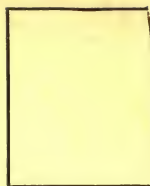
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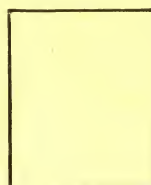


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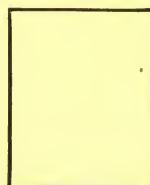


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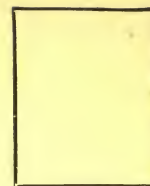


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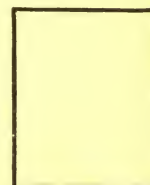


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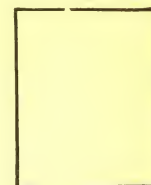


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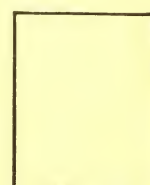


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MUNICIPAL ENGINEERING SPECIFICATIONS



THE Publishers desire to draw the attention of Municipal Engineers to the pages immediately following this announcement, wherein will be found specifications on Roadways and Sewers. These specifications have been drawn up by a competent Engineer and are "standard" in every respect. It is hoped that this addition will prove beneficial to Municipal Engineers.

Any criticisms and suggestions tending towards the improvement of these specifications will be greatly appreciated by the Publishers.

PAVEMENTS

NOTE—The cross section of a road should form a parabolic curve. The height of the centre of the road above the edge of the road is known as the crown. Let the width of the road in feet = W, the crown of the road in feet = C, and the grade of the road in feet per 100 = G, then for brick, stone block, and wood block pavements

$$C = \frac{W(100 - 4G)}{6,000}$$

and for asphalt and bituminous pavements

$$C = \frac{W(100 - 4G)}{5,000}$$

SUB-GRADE.

(1) The whole of the area to be paved shall be excavated or filled to a sub-grade at such a depth that after being compacted by the roller the surface will be inches below the pavement datum, and truly parallel thereto. In excavating, the earth must not be disturbed below the sub-grade. If the material at sub-grade is of an unstable character and unfit for foundation in the opinion of the Engineer, the Contractor shall make such additional excavation as may be determined by the Engineer and refill with approved material. After all necessary grading has been done to bring this surface to sub-grade, the street shall be thoroughly rolled with an approved road roller weighing not less than ten tons. Areas inaccessible to the roller shall be rammed until they are as well compacted as the rolled surface. When the rolling is completed in no place shall the finished surface vary more than $\frac{3}{8}$ of an inch from the true sub-grade.

(2) If, after rolling is completed, the surface shall be disturbed in any way it must be relaid and properly compacted.

(3) If settlement occurs the depressions shall be filled and then re-rolled until the surface is solid, uniform and parallel with the grade and cross-section of the finished pavement.

(4) Where the natural surface of the ground is below sub-grade or shall become so by the removal of old pavement or other structures, it must be filled to the sub-grade in layers not exceeding five inches in depth and each layer must be thoroughly rolled or rammed before the next layer is placed upon it.

SUB-DRAINAGE.

(5) Where the soil is of such a character that it retains an excessive amount of moisture, such as clay or sands similar to quick sand that do not afford a ready natural drainage, sub-drains should be provided by the Contractor as directed by the Engineer.

(6) Drains shall be of two kinds: first, tile drains of porous material or of vitrified tile laid with open joints; second, trenches filled with broken stone, gravel, cinders or other approved material.

(7) The kind of drains to use, the size, and the location of the drains shall be determined by the Engineer, and no drains constructed without the approval of the Engineer shall be paid for.

(8) In all cases the drains shall be connected to the existing sewers, catch basins or inlets.

MACADAM FOUNDATION.

(9) The macadam base, after being thoroughly consolidated by rolling with a roller weighing not less than 10 tons, shall have a thickness of inches and be inches below and parallel to the pavement datum.

(10) The broken or crushed stone shall be of hard, sound, durable rock.

(11) After the sub-grade has been carefully prepared a layer of clean stone passing a three inch screen and held on a two inch screen shall be spread to a depth sufficient, when thoroughly rolled, to form about two-thirds of the total thickness of the base. Over this layer stone screenings shall be spread with shovels in sufficient quantity to fill the voids between the larger stone.

The screenings shall be well rolled in during the process of spreading with a roller weighing at least ten tons.

(12) When the stone appears to be well filled the surface shall be watered and again rolled until the stone is compacted and no more screenings can be forced in.

(13) When the first layer is thus completed a second layer of clean stone passing a two-inch screen and held on a one-inch screen shall be

spread to a depth sufficient when thoroughly rolled to form the remaining one-third of the total thickness of the base. Over this area of stone, screenings shall be spread with shovels and rolled in with the application of water by sprinkling until the stone is well bonded and no more compression can be observed under the roller.

BITUMINOUS MACADAM FOUNDATION.

Use paragraphs 9, 10 and 11, omitting "about two-thirds of" in paragraph 11.

(14) When the stone appears to be well filled the surface shall be given a penetration coat of heavy asphalt or refined tar binder or as directed by the Engineer using not more than one and a half gallons, nor less than one gallon to a square yard.

CONCRETE FOUNDATION.

(15) Upon the sub-grade, a bed of concrete shall be laid to the depth and extent shown on the drawings. Concrete shall be composed of not less than one part best Portland Cement, of an approved brand, to three parts approved clean, sharp sand, and six parts approved broken stone. These ingredients to be measured in separate boxes, specially constructed by the contractor for the purpose. The Engineer reserves the right, however, to alter the above proportions at any time, but in no case shall the proportion of cement be less than one part of cement to nine parts of sand and broken stone.

(16) The Cement must be of some standard approved brand of Portland Cement and must conform in every respect with the latest specifications of the "American Society for Testing Materials" for Portland Cement.

Cement which at any time appears inferior or shows signs of deterioration or blowing will be rejected and any work done with such cement must be forthwith removed and replaced with approved cement at the Contractor's expense as and when the Engineer may direct.

The Cement will be tested by the Engineer or his agent from samples taken from time to time and no other test will be accepted.

All sand for concrete must be clean, coarse and sharp river sand, free from dirt, dust, and any other impurity or foreign matter.

Samples must be submitted to the Engineer for approval before starting the work, and any sand which shall vary from the approved sample shall be rejected.

No broken stone for concrete shall exceed $2\frac{1}{2}$ inches in any direction or be less than $\frac{3}{4}$ inch in any direction. All stone must be able to pass through a 2-inch ring and must be thoroughly screened and free from dust or dirt.

(17) After the concrete is laid it shall remain undisturbed for such a time as the Engineer may direct (usually two days where paving block surfaces are to be laid and six days for bituminous surfaces).

During this period no hauling over the concrete shall be permitted unless authorized by the Engineer when the surface must be covered by planks.

(18) Where shown on the drawings or directed by the Engineer, the contractor shall reinforce the concrete with wire mesh, expanded metal or other approved reinforcing of area satisfactory to the Engineer. The reinforcing shall be placed in the concrete at one-third from the surface of the total thickness of the concrete.

CONCRETE CURB AND GUTTERS.

(19) Concrete Gutters, Curbs, or combined curb and gutter must be constructed by the Contractor in exact accordance with the dimensions shown on the drawings and where directed by the Engineer.

(20) For the body of the work the proportions of the concrete ingredients shall be the same as used for the concrete base and of the same qualities of materials.

(21) For the finishing surface which shall be at least $1\frac{1}{2}$ inch thick, a mixture of two parts of approved Portland Cement to three parts of crushed granite or $\frac{5}{8}$ inch limestone shall be used. All dust shall be screened out of the crushed granite or limestone, and no particle shall be over $\frac{5}{8}$ inch in any dimension.

The entire surface, both of the curb and gutter, must finally be floated with neat cement and finished by skilled workmen accustomed to such work.

(22) Proper provision must be made for expansion and contraction, and the Engineer reserves the right to vary the height of the curb and the grade of the gutter as he desires.

ASPHALT.

(23) Samples of the asphalt and all ingredients and materials proposed to be used must be furnished to the Engineer at least ten days before commencing work, all of which must be approved by him, and no materials shall be used which are in any way inferior to the approved samples. Only the best qualities of well known brands of asphalts which can be made into a suitable paving mixture shall be used, and the Contractor must furnish the Engineer with proper certificates of shipment or other satisfactory evidence, showing the exact locality from which the crude asphalt or any of the ingredients used have been obtained, when so required by the Engineer.

(24) The crude asphalt, as obtained from the mines or natural deposits shall be refined by melting at a temperature not exceeding 450 degrees F. to drive off water and separate other substances.

Refined asphalt thus prepared shall be free from water, and shall not contain an injurious quality of light oils or other matter. It shall contain not more than four per cent. of organic matter and not more than thirty-five per cent. of mineral matter other than bitumen, and not less than fifty-six per cent. of bitumen soluble in carbon di-sulphide.

Refined asphalt may be prepared by the distillation of an asphaltic petroleum at a temperature not exceeding 700 degrees F.

(25) All refined asphalt shall comply with the following requirements:

It shall be homogeneous.

Melting point shall not be less than 130 deg. F., nor more than 145 deg. F.

Solubility in carbon tetrachloride shall not be less than 98½ per cent.

Penetration at 77 deg. F. shall not be less than 60 nor more than 100, the penetration test being made with a No. 2 needle for five (5) seconds under a load of 100 grams and the penetration at 100 deg. F. shall not exceed three times its penetration at 77 deg. F., the conditions of time and load being as above established.

Ductility at 77 deg. F. shall not be less than 40 centimeters, the rate of elongation being five centimeters per minute.

It shall not lose more than three per cent. by volatilization when maintained at a temperature of 325 deg. F. for five hours in a shallow dish, the bottom of which is covered with bitumen to a depth of ½ inch, nor shall the penetration of the residue after such heating be less than one-half the original penetration. It shall not contain more than 18 per cent. of fixed carbon.

Asphalts that are injuriously affected by water shall not be used.

FLUX.

(26) For softening and tempering refined asphalt, the following may be used:—Liquid asphalt or maltha, asphaltic petroleum residue, paraffine petroleum residuum, or other softening agent from which the lighter oils have been distilled, without cracking, until the flux has the following characteristics:

Specific gravity from 0.939 to 0.972 at 60 degrees F. loss on volatilization at 335 degrees F. in seven hours not more than 5 per cent.

The flux must be approved by the Engineer.

(27) The asphaltic cement shall be made of a mixture of the refined asphalt and flux, proportioned so as to show the presence of about 22 per cent. asphaltine and to have a penetration of from forty to eighty, as the Engineer may determine, when tested at a temperature of 77 degrees F. in a standard Dow penetration apparatus.

(28) When a cement of the desired qualities of consistency and hardness shall be determined upon and approved of by the Engineer, samples shall be kept as a standard and all subsequent batches must be made to conform thereto.

(29) To prepare the cement, the refined asphalt shall be heated to about 300 deg. F. or to such a temperature as will admit its agitation by forced introduction of air or by any suitable mechanical method approved of by the Engineer. When the asphalt is thoroughly melted the flux will be introduced and the whole shall be thoroughly mixed.

COAL TAR CEMENT.

(30) The coal tar cement shall be residue of the distillation of coal tar only, and shall be refined for the special purpose of making a paving cement.

No mixture of hard pitch with the lighter oils of coal tar will be permitted.

Its specific gravity shall be not less than 1.20 nor more than 1.29 at 69 degrees F.

The melting point determined by the cube method shall be not less than 100 degrees F. and not more than 115 degrees F.

It shall contain not less than 15 per cent., nor more than 30 per cent. of free carbon insoluble in benzol.

It shall be free from water as determined by distillation and shall show upon ignition not more than ½ per cent. of inorganic matter.

No distillate shall be obtained lower than 338 degrees F. and up to 600 degrees not less than 5 per cent., and not more than 20 per cent. of distillate shall be obtained. The distillate shall be of a gravity of not less than 1.03 at 60 degrees F. The residue shall have a melting point of not more than 165 degrees F. In making this distillation an 8 ounce glass retort shall be used and the thermometer suspended so that before applying the heat the bulb of the thermometer is one-half inch above the surface of the liquid. The melting point of the pitch shall be determined by suspending a ½ inch cube in a beaker of water 1 inch above the bottom. The temperature shall be raised 9 degrees per minute from 60 degrees F. The temperature recorded the instant the pitch touches the bottom shall be considered the melting point of the pitch. In testing the original materials the initial temperature shall be 40 degrees F.

WATER-GAS TAR CEMENT.

(31) The specific gravity at 25 degrees C. shall be between 1.155 and 1.170.

On extraction with cold carbon disulphide at room temperature for 20 minutes, not less than 97½ per cent. shall be soluble.

When tested in a penetrometer at 25 degrees C., with a No. 2 needle under 100 grams load for 5 seconds, it shall have a penetration of not less than 27.5 and not more than 32.5 mm.

When 100 cc. are distilled in a 250 cc. Engler flask according to the method proposed by the American Society for Testing Materials, the loss by weight shall be within the following limits:

From start to 170 degrees C.....	0.
170 to 225 degrees C.....	Not over ½%.
225 to 270 degrees C.....	From 2 to 6%.
270 to 300 degrees C.....	From 5 to 9%.
Residue	Not less than 84%.

SHEET ASPHALT PAVEMENT.

(32) Sub-grade—Use specifications given above.

(33) Foundation—Use concrete foundation as specified.

(34) Asphalt pavement surface shall be laid in two courses called the base course and the surface course. The base course may be from 1 inch to 1½ inches thick and the surface course may be from 1 inch to 2 inches thick. (The base course is usually 1 inch thick and the surface course 2 inches thick.)

(35) The asphalt cement shall be prepared from crude asphalt, refined and fluxed as hereinbefore specified.

(36) The sand shall be of a superior quality of sand, practically free from organic matter, mica, soft grains and other impurities. The grains shall be moderately "sharp" and must be of assorted sizes so that the voids in the sand shall not exceed 33 per cent. Not more than 10% shall be held on a No. 10 sieve and not more than 5% shall pass the No. 200 mesh. The sand shall vary from ¼ inch screen size to dust.

(37) The filler shall consist of Portland Cement or crushed stone or sand so fine that the whole will pass the No. 50 sieve, 90 per cent. will pass the No. 100 sieve, and at least 70 per cent. will pass the No. 200 sieve.

(38) The stone for base course shall be of crushed hard durable stone. All the stone shall be retained upon the No. 8 sieve and all the stone shall pass a square mesh screen whose lineal dimension of mesh is ¼ inch less than the thickness of the base course.

(39) The base course shall be formed of a mixture of the stone above specified heated by passing through revolving heaters to a temperature of not more than 325 degrees F., mixed with sand, filler and asphaltic cement.

The sand, stone and filler shall be thoroughly mixed at a temperature between 310 degrees and 325 degrees F. before the asphaltic cement at a temperature not above 325 degrees F. and not below 300 degrees is added.

The proportions of the mixture shall be as specified by the Engineer.

The following is a typical mixture by weight:

Crushed Stone	64
Sand	27
Pure bitumen (in asphalt cement)	4.5
Pulverized stone or filler	4.75

(40) The mixture, while still hot, shall be carefully spread on the concrete with hot iron rakes to a thickness of at least twice the desired thickness of the course after rolling. Immediately after spreading it shall be rammed and rolled with a ten ton asphalt roller while in a hot and plastic condition until it has the specified thickness. The surface after rolling shall be exactly parallel with the finished surface of the pavement to be laid. The surface course must be laid within one day of the laying of the base course.

(41) The surface course mixture shall be composed of the asphalt cement, sand, and filler as hereinbefore specified, and the proportions shall be as specified by the Engineer to suit the purity of the asphalt cement, the character of the sand, the climatic conditions and the nature of pavement desired.

(42) The materials shall be mixed at the temperatures and in the manner specified for the base course mixture.

A typical mixture will contain by weight:

Sand	75
Pulverized mineral passing No. 200 screen	13.5
Pure bitumen in asphalt cement	10 to 10.5

(43) Before the surface course is spread the base course must be thoroughly cleaned. Care must be taken not to break or disturb the base course.

The material for the surface course shall be so evenly spread and graded with asphalt rakes that after it is properly compacted by rolling the surface will coincide with the pavement datum within the following limits:

(44) When completed the surface shall have an average depth of (.....) inches and must be so free from waves or irregularities that a template not less than 12 feet long, when applied to the street surface, shall nowhere show a divergence from the designed true surface of more than $\frac{3}{16}$ inch and a template 16 feet long applied to the gutters shall show no divergency from the true gutter grade greater than $\frac{1}{8}$ inch.

(45) Directly after the material is graded with the asphalt rakes it shall be rolled with a hand roller or light steam roller, to partly compress the material, and when so directed by the Engineer, the surface shall then be ironed with smoothing irons heated to a temperature that will melt, but will not burn the asphaltic cement.

A thin layer of Portland cement shall then be swept over the surface, which shall at once be rolled with a ten ton asphalt roller until the material is thoroughly compressed and its surface is brought to the grade and contour designed for the street surface.

(46) The work of the ten ton roller must begin before the material has cooled below 200 degrees F., and be continued until the roller makes no further impression on the surface.

Any portions of the surface not accessible to the roller shall be rammed with hot rammers until compacted equally with the rolled portion.

(47) Before the surface course is placed the gutter course and all exposed surfaces of curbs, cross walks, manholes, etc., with which the surface course will come in contact must be well painted with hot paving cement or approved pitch.

(48) The street shall not be open to traffic until the pavement is cold and hard.

(49) Asphalt pavement must not be laid in freezing temperatures or in very windy days when the temperature is below 40 degrees F.

(50) The concrete foundation must be perfectly dry, clean and free from loose material.

(51) All paving mixtures when unloaded on the street, should be at a temperature of 260 degrees F. or over, and any mixture whose temperature is below 240 degrees F. must be rejected.

STREET RAILWAY TRACKS.

(52) Where railroad tracks exist the sub-grade and concrete foundation should extend under the tracks. Concrete under the rails should be of a richer mixture than specified for the remainder of the foundation.

(53) When specified the asphalt surface shall be laid directly against the rails and must be thoroughly tamped along and against the rail and

under any projecting portions. The rail must be heated to a temperature of at least 60 degrees F. before the asphalt material is laid around the rail.

BITUMINOUS CONCRETE PAVEMENT.

(54) Bituminous concrete shall be laid upon a Portland cement concrete foundation or bituminous macadam foundation, as may be specified.

(55) The sub-grade shall be prepared as hereinbefore specified.

(56) The concrete foundation shall be (.....) inches deep and constructed as hereinbefore specified.

The bituminous macadam foundation shall be (.....) inches deep and constructed as hereinbefore specified.

(57) Upon the foundation shall be laid the bituminous concrete wearing surface consisting of a mixture of selected hard, tough, crushed stone, sand, filler and asphalt cement as specified for sheet asphalt pavement base, but when specified or authorized by the Engineer, Coal Tar Cement or Water Gas Tar Cement, or a mixture of either of these with asphalt cement may be substituted for the asphalt cement.

The wearing surface shall have a thickness of (.....) inches after thorough compression with a roller. (For heavy traffic a thickness of two inches is sufficient for all practical purposes, and often gives more stability than a greater thickness. For moderate and light traffic a thickness of $1\frac{1}{2}$ inch may be used.) When concrete foundation is used it should be given a light spray of bituminous binder of not more than one gallon to ten square yards before wearing surface is laid.

(58) Mineral Aggregate—Any sound, durable stone such as trap rock, limestone or granite may be used. It should be broken as nearly cubical as possible. Between two kinds of stone choice should usually be made of the one showing greatest toughness. The sand and filler shall be as specified for sheet asphalt pavement sand.

The proportions of the various ingredients composing the Bituminous Concrete shall be as follows:

Bitumen	7-9 per cent.
Passing 200 mesh Screen	7-10 " "
" 80 " " but retained on a 200	10-20 " "
" 40 " " " " " 80	10-25 " "
" 20 " " " " " 40	10-25 " "
" 8 " " " " " 20	10-20 " "
" 4 " " " " " 8	15-20 " "
" 2 " " " " " 4	5-10 " "

The minimum of bitumen allowed shall be used only in mixtures containing the minimum total passing the 80 mesh.

(59) The method of mixing the materials shall be as specified for the base course of the sheet asphalt pavement except that the temperature should be varied to suit the bituminous cement used.

(60) Paving mixture shall be hauled into the street in dump carts covered with canvas and spread to the proper thickness and grade with hot iron rakes and while still pliable shall be rolled with a ten ton roller for not less than ten hours, so that when ultimate compression is accomplished the surface shall be even and true to grade. Along the curb, around the manholes and catch basins where roller cannot reach, the compression shall be made by the use of hot tampers.

(61) All contact surfaces along curb, around manholes, etc., shall be painted with bituminous cement before the paving mixture is laid.

(62) Immediately after rolling, and while the pavement is still warm, a thin seal of pure bitumen cement shall be spread over the surface by means of a rubber squeegee, or brooms, and upon this shall be spread a thin layer of torpedo sand, stone chips or other approved material. After applying this dressing the surface shall be again rolled until it presents a finished appearance subject to the approval of the Engineer.

(63) When a joint is unavoidable, the edge of the cold material shall be trimmed down to a rough feather edge and the surface where the joint is to be made painted over with bituminous cement, the hot material raked over the feathered edge and thoroughly rolled; or, instead, joint strips may be used consisting of strips of canvas about 18 inches wide with three parallel lines of $\frac{3}{4}$ inch ropes sewed on the underside about three inches apart; the joint strips shall be laid on the feather edge of the freshly raked material with the upper rope at the line where the thickness begins to decrease and the rolling completed on top of the canvas as for the finished pavement.

(64) Adapt paragraphs Nos. 48, 49, 50, and 51.

BITULITHIC PAVEMENT.

(65) Bitulithic pavement shall be laid under the patent and rights of Warren Bros. Paving Co., Ltd., which the contractor shall obtain.

(66) The sub-grade shall be prepared as hereinbefore specified.

(67) The foundation may be either Portland cement foundation or bituminous macadam foundation, as hereinbefore specified.

(68) On the foundation shall be laid the bitulithic wearing surface and seal coat so as to have a thickness of two inches after thorough compression. The wearing surface shall be composed of hard crushed stone, sand and Bitulithic Cement.

(69) The Bitulithic Cement, besides being produced with ingredients approved by Warren Brothers Company, shall in all respects comply with the specifications for Asphalt Cement used for Sheet Asphalt Pavement as hereinbefore specified.

(70) The stone and sand shall be heated in a rotary dryer and while still hot be separated into the desired number of different sizes by means of a rotary screen having a minimum screen opening of about $1/10$ of an inch and a maximum opening of about $1\frac{1}{2}$ inch. The openings in the successive screen sections up to $\frac{1}{2}$ inch size shall not vary more than $\frac{1}{4}$ inch and not more than $\frac{3}{4}$ inch for the sizes larger than $\frac{1}{2}$ inch. The aggregate thus separated shall pass into a bin having sections or compartments corresponding to the screen sections. From these compartments the aggregate shall pass into a weigh box, resting on a multi-beam scale. The desired amount of aggregates from each of the above compartments shall be accurately weighed separately on the scale and the batch dropped into a "twin plug" mixer, where it shall be ultimately associated and thoroughly commingled with a predetermined quantity of Bitulithic Cement sufficient to coat all particles of the aggregate and to fill the voids in same. The Bitulithic Cement shall be heated to a temperature ranging from 225 degrees F. to 325 degrees F. before being mixed with the aggregate.

The mixing shall be continued until the combination is a uniform bituminous concrete.

In this condition it shall be hauled to the street and there spread on the clean, dry foundation and thoroughly rolled with a ten ton roller.

(71) The proportions of the various sizes of stone and bituminous cement shall be such that the compressed mixture shall form a street paving structure consisting of mineral aggregate thoroughly permeated with Bitulithic Cement which completely fills all the voids and binds the particles of the aggregate together.

If the percentage of voids in the crushed stone and sand is not low enough a filler of any suitable fine mineral matter may be used to reduce the percentage of voids.

(72) There shall be spread over the Bitulithic surface mixture a seal coat, using per square yard of Bitulithic pavement approximately $\frac{1}{4}$ gallon of Bitulithic Cement, into which shall be incorporated approximately 25 pounds of mineral aggregate not larger than $\frac{1}{4}$ inch diameter. After spreading the seal coat it shall be thoroughly rolled into the Bitulithic surface mixture. A coarser aggregate may be used on grades.

CONCRETE PAVEMENT.

(73) The sub-grade shall be prepared as hereinbefore specified.

(74) Portland Cement—as hereinbefore specified.

(75) Sand—as hereinbefore specified. Use stone grading from 2 inch circular screen down to $\frac{1}{4}$ inch sieve.

(76) The proportions and thickness shall be as specified by the Engineer.

(77) The concrete shall be machine mixed in a continuous mixer, and shall be deposited continuously. Work may only be discontinued at a vertical joint. No concrete shall be mixed or placed when temperature is below freezing point or when the sub-grade is frozen.

(78) The concrete shall be finished to the desired crown of the roadway with wooden floats. Before complete hardening has taken place the surface may be roughened as desired by the Engineer. When a curb or combined gutter and curb is used an expansion joint shall be left between it and the roadway. This joint, which shall not exceed $\frac{1}{2}$ inch in width, must extend entirely through the concrete.

The joint shall be filled with any of the paving pitch cements hereinbefore specified.

(79) Contraction joints of not more than $\frac{1}{2}$ inch shall be provided at 25 feet intervals perpendicular to the centre line of the roadway and extending through the full thickness of the concrete and, if the curb

and gutter is built at the same time, these joints must continue through them.

The contraction joint may be filled with any of the bituminous fillers if so desired by the Engineer.

(80) The concrete must be covered by tarpaulins at the end of each day's work or in the case of rain, and twenty-four hours later a coating of sand shall be spread over the concrete and sprinkled with water daily for at least seven days in order to prevent the concrete drying too rapidly.

(81) If a bituminous surface is required this must be laid at least ten days after the concrete has been laid. Any of the bituminous cements hereinbefore specified may be used.

The bitumen shall be applied hot by means of a sprinkling wagon or hand sprinkling cans. The hot bitumen shall be brushed over the surface or spread by squeegees and shall then be covered with torpedo sand or fine stone chippings. This surface shall then be rolled by a heavy roller if so directed by the Engineer.

From $\frac{1}{3}$ to $\frac{1}{2}$ gallon of bitumen and 0.25 cu. ft. of aggregate shall be used to each square yard of surface.

GRANITE BLOCK PAVEMENT.

(82) Contractors shall file with the Engineer at the time of bidding a certificate showing the name and location of the quarry from which it is proposed to obtain the blocks, also a certified copy of a test made to show the toughness and "French Co-efficient of Wear" of the granite which he proposes to use.

(83) Ten days before starting work the contractor must furnish the Engineer with six specification blocks made from the granite he proposes to use, which blocks shall be accepted as the standard, and no blocks which are inferior in any way shall be used in the pavement.

(84) The blocks shall be of the following dimensions:

Not less than eight nor more than twelve inches long on top; not less than three and one-half nor more than four and one-half inches wide on top; not less than four and three-quarters nor more than five and one-quarter inches deep.

(85) The blocks shall be of medium grained granite, showing an even distribution of constituent minerals of uniform quality, structure, and texture, without seams, scales or disintegration, free from an excess of mica or feldspar, and equal in every respect to the samples in the office of the Engineer.

The granite shall have a toughness of not less than nine, and a "French Co-efficient of Wear" of not less than eleven when tested by the methods adopted by the U.S. Department of Agriculture, Office of Public Roads.

The average of three tests shall be used for determining toughness and the average of six tests for determining the "French Co-efficient of Wear."

(86) The blocks shall be so dressed that the faces will be approximately rectangular in shape, and the ends and sides sufficiently smooth to permit the blocks to be laid with joints not exceeding $\frac{1}{2}$ inch in width at the top, and for one inch downward therefrom, and not exceeding one inch in width at any other part of the joint. The top surface of the block shall be so cut that there will be no depressions measuring more than $\frac{3}{8}$ inch from a straight edge laid in any direction on the top and parallel to the general surface thereof.

The blocks shall be sorted and laid in courses of uniform width.

(87) The sub-grade shall be prepared as hereinbefore specified.

(88) The foundation shall be of Portland Cement concrete 6 inches thick as hereinbefore specified.

(89) On the concrete shall be spread a layer averaging one inch in depth, of clean, coarse, dry sand, free from all gravel exceeding one-quarter inch in size. Upon this sand bed the blocks shall be laid in courses at right angles to the line of the street, and in a straight line from curb to curb, except in special cases, when they shall be laid at such an angle as may be directed by the Engineer.

The blocks shall be laid as closely as possible, each block touching the adjoining one on sides and ends, and in courses of uniform width. All joints shall be broken with a lap of at least three inches. The blocks shall not be laid more than twenty-five feet in advance of the ramming.

(90) After the blocks are laid they shall be rammed to a solid bearing, the joints shall be adjusted, all unsatisfactory blocks shall be taken out with tongs and all low blocks shall be raised to an even and true surface.

Pinch bars shall not be used except by special permission of the Engineer, and no sand shall be placed in the joints except when mixed with bituminous concrete filler as specified.

(91) The joints may be filled with cement grout, tar pitch or asphalt pitch as desired and specified by the Engineer.

CEMENT GROUT FILLER.

(92) After the pavement has been brought to a uniform surface, Portland Cement grout shall be poured into the joints until it appears on the surface. The grout shall be broomed or scraped into the joints, if necessary to fill the same, and the operation shall be repeated as the grout settles and before the initial set has taken place, until the joints are thoroughly filled flush with the surface of the blocks. Immediately after this, the entire pavement shall be broomed to a smooth surface. The blocks shall be wetted immediately after applying the grout.

The cement grout shall be composed of one part Portland Cement, and one part of clean, sharp sand. The cement and sand shall be thoroughly mixed dry and only enough clean, fresh water shall be added to make a grout which will flow to the bottom of the joints.

After the grouting is completed and a sufficient time for hardening has elapsed so that a coating of sand will not absorb moisture from the cement mixture, one-half inch of sand shall be spread over the whole surface and shall be kept damp until the street is opened for traffic.

After the grouting is completed, the street shall be kept closed until at least seven days have elapsed.

TAR PITCH FILLER AND ASPHALT FILLER.

(93) The joint filler used shall be the (paving pitch) (asphalt cement) hereafter described thoroughly mixed with as much hot, dry sand as the (pitch) (cement) will carry, but in no case shall the volume of the sand exceed the volume of the (pitch) (cement). The sand shall be fine and clean and all of it shall pass a 20 mesh screen. It shall be heated to a temperature of not less than 300 degrees F., nor more than 400 degrees F., and shall be between these limits when mixed with the paving (pitch) (cement). The paving (pitch) (cement) shall be heated in kettles equipped with a thermometer to register the temperature of the (pitch) (cement).

(94) The mixture shall be flushed on the surface of the blocks and pushed into the joints with suitable tools, re-flushing or re-pouring, if necessary, until the joints remain permanently filled flush with the surface of the pavement. As little as possible of the mixture shall be left on the surface.

(95) Tar pitch shall comply with the following requirements:

(a) It shall have a specific gravity between 1.23 and 1.33 at 60 degrees F.

(b) It shall have a melting point between 115 and 135 degrees F., determined by the cube method in water.

(c) It shall contain not less than 20 per cent. nor more than 35 per cent. of free carbon insoluble in hot benzol or chloroform.

(d) It shall contain not more than $\frac{1}{2}$ per cent. of inorganic matter.

(e) It shall be free from water.

(f) It shall have a ductility of not less than sixty centimeters at 77 degrees F.

(96) Asphalt cement filler shall be prepared from refined asphalt as specified for asphalt as used in sheet asphalt pavement.

(97) The asphalt filler shall be used on the work at a temperature of not less than 275 degrees F., and shall at no time be heated above 350 degrees F.

(98) The tar pitch shall be used on the work at a temperature of not less than 250 degrees F., and shall at no time be heated above 325 degrees F.

(99) The (pitch) (cement) shall be delivered where directed by the Engineer in time to allow for examination and analysis.

(100) In applying the filler care shall be taken that the pavers are closely followed by the filler gang, and in no case shall work be left over night or stopped, without the filling of the joints being completed.

(101) In case of rain the joints shall be protected by tarpaulins or other approved method. Under no circumstances shall the filler be poured into wet joints.

STREET RAILWAY TRACKS.

(102) The sub-grade and pavement foundation shall extend under the rails free from interruption except by the ties or other structures connected with the railroad track.

(103) For a distance of (.....) inches on outside of rail and (.....) inches inside measuring from the centre of the rail, a layer of mortar from 1 to $1\frac{1}{2}$ inch thick shall be spread.

The mortar shall consist of one part Portland cement to three parts sand.

Upon this bed of mortar, before it has begun to set, paving blocks shall be bedded against the rail on both sides. The blocks shall break joint with the blocks of the adjoining pavement.

(104) Selected blocks with well dressed surfaces shall be used.

The blocks shall be set with their tops level with the top of the rail. The blocks shall be bedded into the mortar by the use of paving hammers, but they shall not afterwards be rammed. As the blocks are set any spaces between them and the web of the rail shall be filled with cement mortar.

(105) The joints shall be filled in the same manner as specified for the remainder of the pavement.

(106) Where required by the Engineer, blocks of special size or shape shall be furnished. (Note—The width of mortar bed outside the rail is usually from 13 to 19 inches and about 15 inches inside.)

SIDE-WALKS.

(107) The side-walk shall be laid in sections of not less than (.....) square feet and of not more than (.....) square feet as the Engineer may direct, or as an alternative, the side-walk shall be laid in blocks adjoining each other with a strip of wood $\frac{1}{2}$ inch thick and 4 inches deep entirely separating each block. These strips shall be removed ultimately and the joints filled with sharp sand.

(108) The joints shall be straight, narrow, smooth and at right angles to each other.

(109) The side-walk shall have a pitch towards the curb of (.....) inch to the foot, (generally $\frac{3}{8}$ inch to the foot).

After the roadway is completed as hereinbefore specified the side-walk shall be laid.

(110) The sub-grade shall be (.....) inches below and parallel with the top of the finished side-walk, and on this sub-grade a foundation of broken stone, screened gravel, or soft coal clinkers shall be laid and rammed until it has a thickness of (.....) inches when completed.

(111) Upon this foundation a concrete base (.....) inches thick shall be laid. The concrete shall consist of one part Portland cement, to two parts sharp sand, and five parts broken stone, graded from $1\frac{3}{4}$ inches in greatest dimension to $\frac{1}{4}$ inch in greatest dimension. All materials to be of same quality as hereinbefore specified for Portland cement concrete.

The concrete shall be mixed in an approved manner, placed, and thoroughly rammed and allowed to set for a time specified by the Engineer before being walked or worked upon.

(112) Upon this base, before it has commenced its initial set, a wearing surface one inch deep shall be laid. The wearing surface shall consist of concrete made of one part Portland cement, and one part of fine crushed trap or granite rock screened through $\frac{1}{2}$ inch mesh, or as an alternative one part of clean, sharp sand, moderately coarse, which shall all pass the 10 mesh screen and not more than 5 per cent. shall pass the 30 mesh screen.

(113) All concrete shall be fitted around coal holes, posts, etc., in such a manner as to allow of their removal without injury to the concrete.

(114) The sidewalk shall be given an indented finish if required by the Engineer.

(115) The color of the wearing surface when laid shall be as specified by and satisfactory to the Engineer, and coloring substances shall contain nothing injurious to the concrete.

(116) Any defective work which occurs in any section or block caused by bad materials, faulty construction, settlement, or lack of proper protection of the work, within (.....) years after the date of completion must be immediately replaced and made good in conformity with these specifications by the Contractor and at the Contractor's expense when notified to do so by the Engineer.

SEWER CONSTRUCTION

GRAVEL.

The work to be done consists of (specify fully the work required).

The price bid includes the necessary labor and material for removing the pavement and foundation for all earth excavation, and refilling, all sheeting and bracing, clearing the ground, fencing, constructing temporary bridges, furnishing and handling all material, making all connections (replacing all pavements) (and constructing the concrete) (brick) (sewer) laying (the concrete) (vitrified) (cast iron) (steel) pipe sewer, building manholes and basins, laying drains, making basin connections, constructing spurs, and doing all work shown on the plans and in exact conformity therewith and as hereinafter specified to the satisfaction of the engineer.

(A special price for rock excavation should be included in the contract.)

TRENCHING.

Trenches shall be excavated to the depths shown on the plan and to such additional depths as may be directed by the engineer.

The minimum width of trenches in earth for pipe sewers, basin connections, house connections, and other drains not over 18 inches in diameter, shall be sufficient to give a clearance of 8 inches on each side of the pipe and for those of larger diameters a minimum clearance of 10 inches is required. Where cradles to be used have a maximum width greater than the minimum widths above specified the trench must be excavated at least as wide as the cradles.

For other types of sewers the width shall be the greatest external width of the structures, including the forms.

The excavation in earth for brick receiving basins, catch basins and flush tanks, shall be of sufficient size to give a clearance of one foot inside the sheeting on all sides and to include the foundation as shown on the plans.

Not more than feet of trench shall be open at any time ahead of the completed sewer and not less than feet of trench shall be excavated to its full depth ahead of the minimum length of sewer permitted to be laid.

Trenches for basin connections and house connection drains shall be fully excavated for their entire length before any pipes are laid therein.

SHEETING.

Where necessary, the sides of the trenches and excavations shall be supported by timber sheeting and bracing. Sheeting against which concrete is placed shall not be removed, but such sheeting shall not be paid for. Where sheeting is ordered by the engineer in writing to be left in place such sheeting shall be paid for at the contract price for such material.

The contractor will be responsible for the sufficiency of all sheeting and bracing used and for all damage to persons or property resulting from the improper quality, strength, placing, maintaining or removing of the same.

Where required by the engineer, the sheeting shall be driven to such depth below the bottom of the sewer as he may direct.

No tunneling shall be done except with the consent of the engineer.

The contractor shall clear the surface and remove all stumps, stones and other encumbrances affecting the prosecution of the work and shall remove them from the site.

The excavated material and construction materials shall be so deposited, and the work shall be so conducted as to leave open and free all cross walks at least 3 feet in width of all sidewalks and a roadway at least 10 feet wide. All hydrants, water valves, fire alarm boxes and letter boxes shall be available for use at any time.

Any surplus of excavated material beyond which can be stored on the sidewalks and roadway must be removed from the work and stored and after the construction of the sewer as much of this material as is of satisfactory quality and necessary for the purpose shall be brought back and used for back filling the trench.

FENCING.

Where required by the engineer, suitable fences shall be placed along the sides of the trenches to keep the streets safe for traffic.

TEMPORARY BRIDGES.

Crosswalks, where intersected by trenches, shall, if required by the engineer, be temporarily replaced by timber bridges at least 3 feet wide with side railings.

Where required for vehicles temporary bridges shall be provided of a width specified by the engineer.

WATER.

The contractor shall keep the trenches and excavations free from water at all times. The water shall be disposed of to the satisfaction of the engineer.

ROCK EXCAVATIONS.

Rock excavations shall include the excavation and removal of the following materials:

Rock which requires to be blasted in order to insure the proper prosecution of the work.

Boulders and pieces of rock, masonry, and concrete which contains $\frac{1}{3}$ cubic yard or more.

Any rock, masonry or concrete which slides or falls into the trench from beyond the lines thereof will not be measured and any such material must be disposed of by the contractor at his own expense.

The required width of trench in rock or pipe sewers, basin connections, house connections and other pipes will be sufficient to allow of a clearance of one foot on each side of the pipe, exclusive of spurs and hubs.

The required width of trench in rock for other sewers will be sufficient to allow of a clearance of one foot on each side of the structure to be built therein. For receiving basins, catch basins and flush tanks the required dimensions of the excavation must be sufficient to give a clearance of one foot on all sides above the foundations.

Rock shall be excavated to the depths required for the cradles and foundations of the structures as shown on the plans and not less than 4 inches below the outside of the barrel for the pipe sewers.

The volume of rock to be paid for will be that contained in prisms with vertical sides and of such dimensions as to give the widths and clearances hereinbefore specified from the bottoms of the trenches as specified and as shown on the plan to the surface of the rock.

Wherever a branch for a proposed sewer or extension of a sewer is built in rock the required trench shall be excavated for at least 5 feet beyond the end of such branch.

All blasting operations shall be conducted in strict accordance with existing ordinances and regulations relative to rock blasting and the storage and use of explosives. If directed by the engineer, any excavation within 10 feet of a water main shall be done without blasting.

All exposed sewers, manholes and other structures shall be carefully protected from the effects of blasts. Any damage done to such structures shall be promptly repaired by the contractor at his own expense.

BACK FILLING.

All trenches and excavations shall be back filled immediately after the structures are built therein. For a depth of at least 2 feet over sewers, connections and drains, the material used shall be clean earth, sand or rock dust. This material shall be carefully deposited and solidly tamped with suitable tools in layers of 6 inches or less in depth.

The remainder of the filling shall be of approved material free from organic matter and containing no stones over 10 inches in size.

Back filling shall, if required by the engineer, be puddled with water instead of being tamped.

All cavities around sheeting or left after sheeting is withdrawn shall be solidly filled as directed.

Unless otherwise shown on the plans or required by the engineer, all trenches and excavations shall be backfilled to the original surface of the ground and any additional approved material required for this purpose shall be supplied by the contractor.

All street pavements, sidewalks and other surfaces, opened or damaged by the works herein specified shall be replaced and made good by the contractor to the satisfaction of the engineer.

No sewer, drain, connection or other work shall be covered until the engineer has inspected, measured and located the same and given permission to backfill the trenches over them.

As trenches are backfilled the contractor shall remove all surplus material and, if required, shall dispose of it where and in the manner directed by the engineer.

The contractor, until the date of the final payment, shall maintain in good and safe condition the surface of the street over the trenches and fill all depressions caused by settlement of back filling. If the contractor fails to maintain the roads, streets, and sidewalks as specified herein within 24 hours of being instructed to do so in writing by the engineer, the (city) (town) may furnish all materials and do all work required and charge the contractor with the cost thereof, deducting such cost from any moneys due or to become due the contractor under this contract.

CONCRETE SEWERS.

(Specify Portland cement requirements as found under "Pavements.")

Use broken stone which will pass a 1 inch mesh screen and be retained on $\frac{1}{8}$ inch mesh screen.

Use for Class A. concrete a mixture of 1 part of cement, 2 parts of sand, and 4 parts of broken stone.

For Class B. concrete use a 1: $2\frac{3}{4}$: 5 mixture.

INVERTS.

Inverts of concrete sewers shall be formed between transverse templets and shall be screeded unless other material is used for lining. The templets shall be placed at approved intervals and the concrete shall be deposited in alternate sections and allowed to set before the remaining sections are poured. Unless otherwise shown on the plans, a layer of mortar $\frac{1}{2}$ inch thick shall be spread smoothly upon the concrete as soon as the concrete is in place.

Where the radii of inverts are too short to permit screeding between templets, the inverts shall be shaped by means of suitable forms, which shall be removed as soon as the concrete has a sufficient set and the surfaces shall be floated to a smooth finish, if required.

Where shown on the plans, inverts shall be lined with brick, tile, or other material which shall be laid at such times and in such manner as the engineer may direct.

SIDE WALLS.

Concrete in the side walls shall be deposited continuously to the height directed and in convenient longitudinal distances.

ROOF.

Concrete in the roofs shall be deposited continuously for the full depths and widths of the roofs and in convenient longitudinal distances.

BULKHEADS.

Temporary bulkheads used for confining concrete as it is deposited shall be designed to give an approved shape to the end of the section of concrete under construction, shall be secured in place before concrete is deposited, and shall remain until concrete is sufficiently set to retain its shape.

REINFORCEMENT.

Where shown on the plans, concrete sewers shall be reinforced with metal of the dimensions and shapes shown and which shall conform to the latest revised specifications for steel reinforcement adopted by the American Society for Testing Materials.

All reinforcing bars shall be as long as can be conveniently used and when a joint is required it shall be made by means of approved clamps, or by looping the ends of the bars around each other in such a manner as to produce and maintain tension on the joint during construction, or by lapping the ends of the bars as directed, and wiring them together in an approved manner or by lapping the ends of the bars for a distance of 21 times their nominal diameters for deformed bars and 40 times their nominal diameters for plain bars and with a space not less than 2 inches between them.

Joints in longitudinal bars shall be staggered as directed.

GENERAL.

Unless otherwise permitted or ordered by the engineer, not less than 16 feet of foundation or invert for sewer shall be built at one operation.

All connections and branches shall be built in where shown on the plans or where directed and these connections and branches shall be closed with bulkheads as shown on the plans or directed.

The lengths of concrete sewers will be determined by measurements along their inverts parallel to the centre lines. No deductions will be made for openings at branches or manholes. The measurement of a branch concrete sewer will be made from the inner surface of the wall of the main sewer to which it connects. A reducer will be paid for at the contract price for the sewer at the larger end thereof.

PRICES TO COVER.

The contract prices for concrete sewers shall cover the cost of all necessary excavation (except rock, when there is a contract price for rock excavation); of furnishing, maintaining and removing all forms, centres, templets, and temporary bulkheads; of all openings and bulkheads; also the removal of all bulkheads in the ends of sewers to which connection is made by the sewers in this contract; of all back filling and repairing streets and sidewalks; of all embankments required; and of all labor and materials required to construct concrete sewers as shown by the normal sections on the plans and as specified.

BRICK SEWERS.

QUALITY OF BRICKS.

All bricks shall be sound and hard burned throughout and of uniform size and quality. They shall be specially selected and no bats shall be used except for closers.

Where shown on the plan, vitrified bricks of approved size and quality shall be furnished and laid. After having been thoroughly dried and then immersed in water for 24 hours they shall not absorb more than 4 per cent. of their weight of water.

Bricks shall be laid wet and each brick shall be laid in mortar so as to form full bed, end and side joints in one operation. The joints shall be not wider than $\frac{3}{8}$ inch. Brickwork shall be laid with an approved bond and wherever possible the joints shall be struck and pointed on the inside.

Inverts of brick sewers shall conform to lines drawn between transverse templets. The arches shall be built on substantial centres and shall be keyed with stretchers in full joints of mortar. The centres shall be true to the required shapes and sizes and shall be of ample strength and properly secured in place. The extrados of the arches shall be smoothly and evenly plastered with a layer of mortar $\frac{1}{2}$ inch thick. The centres shall be left in place until the trench is back filled for its full width to a height of at least 1 foot above the crown of the extrados of the arches. No centre shall be struck or removed without the engineer's permission.

Mortar used in the haunch walls of brick sewers shall be composed of 1 volume Portland cement and 3 volumes of sand. All other mortar shall be composed of 1 volume of cement and 2 volumes of sand. The sand shall be clean and sharp, free from dirt, loam, mica, and organic matter, and shall contain not more than 8 per cent. by volume of clay.

All fresh brickwork shall be carefully protected from freezing and shall be sprinkled with water at such intervals as directed by the engineer to prevent too rapid drying.

LENGTH OF CRADLE.

Unless otherwise permitted or ordered, not less than 16 feet of foundation or cradle shall be built at one operation.

GENERAL.

All connections and branches shall be built in where shown on the plans or where directed and these connections and branches shall be closed with bulkheads as shown on the plans or directed.

The lengths of concrete sewers will be determined by measurements along their inverts parallel to the centre lines. No deductions will be made for openings at branches or manholes. The measurement of a branch concrete sewer will be made from the inner surface of the wall of the main sewer to which it connects. A reducer will be paid for at the contract price for the sewer at the larger end thereof.

PRICES TO COVER.

The contract prices for concrete sewers shall cover the cost of all necessary excavation (except rock, when there is a contract price for rock excavation); of furnishing, maintaining and removing all forms, centres, templets, and temporary bulkheads; of all openings and bulk-

heads; also the removal of all bulkheads in the ends of sewers to which connection is made by the sewers in this contract; of all back filling and repairing streets and sidewalks; of all embankments required; and of all labor and materials required to construct concrete sewers as shown by the normal sections on the plans and as specified.

VITRIFIED PIPE SEWERS.

Vitrified pipe sewers and house connections shall be built of shale or clay hub and spigot pipes. They shall be of a tough vitreous material without warps, cracks, or other imperfections, and shall be fully and smoothly salt-glazed over the entire inner and outer surfaces, except that the inside of the hub and the outside of the spigot may be unglazed for two-thirds of the depth of the hub. Vitrified pipe shall be of such toughness that it can be worked with a chisel and hammer, and when struck with a hammer, it shall have a metallic ring.

Each pipe shall have the name of the manufacturer and of the factory where made clearly impressed on its outer surface.

The sizes of the pipes are designated by their interior diameters. Each pipe shall be a cylinder with a circular section and shall have a uniform thickness.

The approximate weight and dimensions for the respective sizes of vitrified pipes shall be as follows:

STANDARD STRENGTH SEWER PIPE.

Calibre.	Weight per ft.	Depth of Socket.	Annular Space.	Thickness.
4 in.	10 lbs.	1 $\frac{5}{8}$ in.	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.
6 "	15 "	1 $\frac{7}{8}$ "	$\frac{3}{8}$ "	$\frac{5}{8}$ "
9 "	30 "	2 "	$\frac{3}{8}$ "	1 $\frac{1}{2}$ "
12 "	45 "	2 $\frac{1}{4}$ "	$\frac{1}{2}$ "	1 "
15 "	65 "	2 $\frac{1}{2}$ "	$\frac{1}{2}$ "	1 $\frac{1}{8}$ "
18 "	95 "	2 $\frac{3}{4}$ "	$\frac{1}{2}$ "	1 $\frac{1}{4}$ "
21 "	120 "	3 "	$\frac{1}{2}$ "	1 $\frac{1}{2}$ "
22 "	130 "	3 "	$\frac{1}{2}$ "	1 $\frac{5}{8}$ "
24 "	150 "	3 $\frac{1}{2}$ "	$\frac{1}{2}$ "	1 $\frac{5}{8}$ "

DOUBLE STRENGTH SEWER PIPE.

Calibre.	Weight per ft.	Depth of Socket.	Annular Space.	Thickness.
15 in.	80 lbs.	2 $\frac{1}{2}$ in.	$\frac{1}{2}$ in.	1 $\frac{1}{4}$ in.
18 "	115 "	2 $\frac{3}{4}$ "	$\frac{1}{2}$ "	1 $\frac{1}{2}$ "
21 "	150 "	3 "	$\frac{1}{2}$ "	1 $\frac{3}{4}$ "
22 "	160 "	3 "	$\frac{1}{2}$ "	1 $\frac{5}{8}$ in.
24 "	200 "	3 $\frac{1}{4}$ "	$\frac{1}{2}$ "	2 in.

CURVES, BENDS, ETC.

Where curved pipes are required they shall be furnished in either one-eighth or one-quarter bends of their respective sizes. Curved pipes, bends, siphons, and special pipe of the sizes and forms shown on the plans shall be provided and laid.

SAMPLES.

For the purpose of making tests as may be required the contractor shall furnish and deliver to the engineer at the place required one length of pipe for each 200 feet of pipe sewer to be laid.

Any or all of the following tests may be applied to samples selected by the engineer.

CRUSHING TESTS.

When supported at the bottom upon a knife edge one inch in width in such a manner that an even bearing is provided throughout the whole length, exclusive of the socket, and pressure is applied at the

crown uniformly through a similar knife edge, the various sizes of pipes shall withstand the following pressures:

Diameter Inches.	Pressure lbs. per lin. ft.	Diameter Inches.	Pressure lbs. per lin. ft.
6	900	22	1750
12	1050	30	2350
15	1250	33	2500
18	1400	36	2800
21	1550	42	3200

DROP WEIGHT TEST.

When supported on a dry sand bed 2 inches deep, all pipe shall withstand without cracking the impact from 2 blows of a cast iron ball weighing 8 pounds falling 18 inches. Spurs shall resist without fracture the impact from 2 blows of such a ball falling 6 inches and striking on the extreme end of the hub of the spur.

HYDROSTATIC TEST.

When subjected to an internal hydrostatic pressure of 10 pounds per square inch, vitrified pipe shall show no percolation.

ABSORPTION TEST.

After having been thoroughly dried and then immersed in water for 24 hours, sample pieces of vitrified pipe about 10 square inches superficial area with all edges broken shall not absorb more than 5 $\frac{1}{2}$ per cent. of their weight of water.

FACTORY REJECTION.

The entire product of any factory may be rejected when, in the judgment of the engineer the methods of manufacture fail to guarantee uniform results or where the pipes under test fail to comply with the requirements specified herein.

Where required by the plans, pipes shall be laid in concrete cradles, in beds of gravel, broken stone, or sand. When the sewer is to be laid in a concrete cradle, the concrete for the full width of the cradle shall be deposited continuously, to the height of the bottom of the pipe, and before the concrete has set the pipe shall be evenly bedded therein and the remainder of the concrete immediately deposited and carefully tamped.

All pipes shall be laid with ends abutting and true to line and grade. The pipes shall be fitted together and matched so that they will form a sewer with a smooth and uniform invert.

JOINTS.

(1) Plain mortar joints shall be made as follows: Before a pipe is laid the lower half of the hub of the preceding pipe shall be plastered with a stiff 1 to 1 mortar. After the pipe is laid the remainder of the hub shall be thoroughly filled with similar mortar and the joint wiped inside and finished to a smooth bend outside.

(2) Gasket and mortar joints shall be made as follows: A closely twisted hemp or oakum gasket of approved diameter in no case less than $\frac{3}{4}$ inch and long enough to pass around the pipe and lap at the top shall be solidly rammed into the annular space between the pipes. Before being placed the gasket shall be saturated with neat cement grout. The remainder of the space shall then be completely filled with plastic mortar mixed 1 to 1 and the joint wiped inside and finished to a smooth level outside.

(3) Joints of sanitary pipe sewers below the normal water table shall be made with a compound approved by the engineer. The compound shall have a bituminous base, shall adhere firmly, shall melt and run freely at a temperature of 250 degrees F., and when set shall be sufficiently elastic to permit of a slight movement of the pipes without injury to the joints. The compound shall not deteriorate when submerged in water or domestic sewage.

The joint shall be made by ramming a gasket into the annular space as specified hereinbefore. The compound heated to about 400 degrees F. shall then be poured into the annular space in such a manner as to completely fill it to within $\frac{1}{2}$ inch of the outer run of the pipe.

All sanitary pipe sewers below the normal water table shall be laid in concrete cradles.

After the joints are run and the concrete cradle is placed these portions of the joints not embedded in the cradle shall be encased in a 1 to 1 cement mortar which shall extend at least two inches from the face and outside of the bell.

INSPECTION.

Unless otherwise specified at least four finished joints shall be left exposed for inspection throughout the working day. Suitable staging and ladders shall be provided to facilitate this inspection.

SUB-GRADE TO BE TESTED.

No pipe or cradle shall be laid until the sub-grade has been tested and found correct.

SEWERS TO BE KEPT CLEAR.

The interior of the sewer shall, as the work progresses, be cleared of all dirt and other materials.

BRANCH PIPES.

Branch pipes and connection pipes shall conform with all the requirements specified herein for vitrified sewer pipes. Dead ends of pipes shall be closed with bulkheads of brick masonry 8 inches in thickness.

BACKFILLING.

(Adopt backfilling as specified for concrete sewers.)

CONNECTION WITH EXISTING WORK.

Wherever the proposed sewer is to connect with an existing manhole in which there is a branch pipe which is damaged or of unsuitable size or in improper position, such pipe shall be removed and be replaced with a pipe of suitable size or be reset in the proper position. The pipe so substituted will be paid for at the contract price for the corresponding size of pipe sewer.

The ends of pipes which enter masonry shall be neatly cut to fit the face of the masonry.

The contract prices for pipe sewers shall cover the cost of all necessary excavation (except rock when there is a contract price for rock excavation); of all sand, gravel, broken stone, or concrete cradles required; of the making of all joints as specified; of all necessary trimming, fitting and building into masonry; of all bulkheads, also the removal of all bulkheads in the end of sewers to which connection is made by the sewers in the contract; of all back filling and repairing streets and sidewalks; of all embankments required; of all samples furnished, and of all labor and materials required to furnish and lay the sewers complete in place, and shown on the plans and as specified herein.

CAST IRON PIPE SEWERS.

Cast iron pipe for sewers shall conform with all the requirements specified hereinbefore for Cast Iron Water Pipes and Special Castings, and all tests required shall be made in accordance therewith.

The thickness of shell and weight of the several classes of pipe, and the allowable variations of diameter and weight shall be as follows:

Nominal Inside Diam. Inches	CLASS A. 100 foot head 43 lbs. pressure		CLASS B. 200 foot head 80 lbs. pressure		CLASS C. 300 foot head 130 lbs. pressure		Allowable Variations Diam. Weight	
	Thickness Inches	Weight Pounds	Thickness Inches	Weight Pounds	Thickness Inches	Weight Pounds		
4	0.42	240	0.45	260	0.48	280	0.06	5%
6	0.44	370	0.48	400	0.51	430	0.06	5%
8	0.46	515	0.51	570	0.56	625	0.06	5%
10	0.50	685	0.57	765	0.62	850	0.06	5%
12	0.54	870	0.62	985	0.68	1100	0.06	5%
14	0.57	1075	0.66	1230	0.74	1400	0.06	5%
16	0.60	1300	0.70	1500	0.80	1725	0.06	5%
18	0.64	1550	0.75	1800	0.87	2100	0.08	4%
20	0.67	1800	0.80	2100	0.92	2500	0.08	4%
24	0.76	2450	0.89	2800	1.04	3350	0.08	4%
30	0.88	3500	1.03	4000	1.20	4800	0.10	4%
36	0.99	4700	1.15	5450	1.36	6550	0.10	4%
42	1.10	6150	1.28	7100	1.54	8600	0.10	4%
48	1.26	8000	1.42	9000	1.71	10900	0.12	4%
54	1.35	9600	1.55	11200	1.90	13700	0.15	4%
60	1.39	11000	1.67	13250	2.00	16100	0.15	4%

The above weights are for 12 feet laying lengths and standard sockets; proportionate allowance will be made for any variation therefrom.

Joints of cast iron pipe shall be of the kind shown on the plan.

LEAD JOINTS.

When lead joints are required the inner portion of the annular space between the pipes shall be packed with clean, sound jute packing yarn and the remaining portion shall be run full of pure, soft lead, and calked with suitable tools. Unless otherwise shown on the plan the depth of the lead joints shall be 2½ inches for 6" to 8" pipe; 3 inches for 12" to 24" pipe, and 3½ inches for 30" to 48" pipe.

MORTAR JOINTS.

When gasket and mortar joints or plain mortar joints are required they shall be made as hereinbefore specified for vitrified pipe sewer joints. All the requirements, as hereinbefore specified, relating to excavation, laying, backfilling and measurements of vitrified pipe sewers shall apply, as far as they are applicable, to cast iron pipe sewers.

PRICES TO COVER.

The contract prices for cast iron pipe sewer shall cover the cost of all necessary excavation (except rock when there is a contract price for rock excavation); of all sand, gravel, broken stone, or concrete cradles required; of the making of all joints; of all bulkheads; of all backfilling; of all embankments required; of repairing all streets and sidewalks; and of all labor and materials required to furnish and lay the sewers complete in place, as shown on the plans and as specified.

WETTLAUER BROS., LIMITED

MANUFACTURERS OF IMPROVED CONCRETE MACHINERY

(MADE IN CANADA).

HEAD OFFICE AND WAREHOUSES: 178 SPADINA AVENUE, TORONTO, ONT., CANADA.

40 PEARL ST., BUFFALO, N.Y.; 2026 MICHIGAN AVE. W., DETROIT, MICH.

FACTORIES: MITCHELL, STRATFORD, GALT AND WOODSTOCK. BUFFALO AND DETROIT, U.S.A.

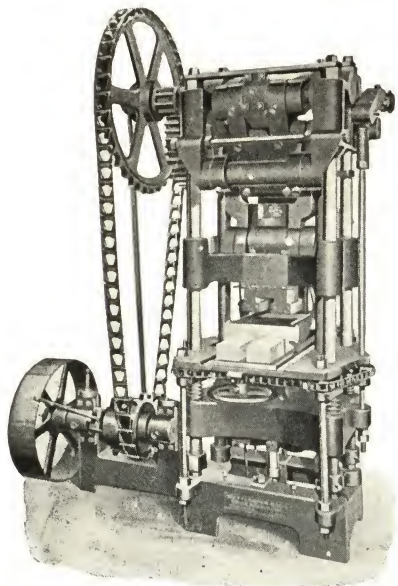
AGENCIES:

CANADIAN FAIRBANKS MORSE, Montreal, Winnipeg and Vancouver, B.C.
WETTLAUER BROS., 10 Masonic Temple, Regina, Sask.

AGENCIES:

J. L. LACHANCE, LTD., 263 St. Paul St., Quebec, Que.
A. R. WILLIAMS MACHINERY CO., 15 Dock St., St. John, N.B.

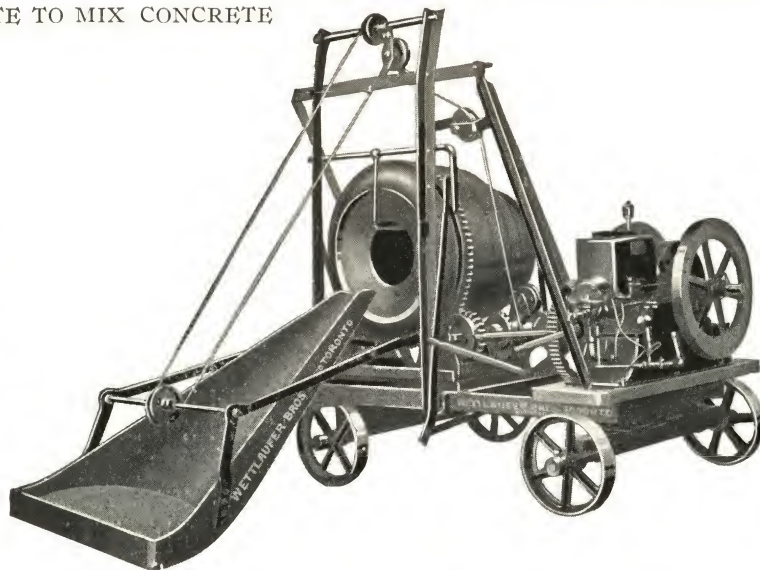
THE LINE COMPLETE TO MIX CONCRETE



POWER BRICK PRESS



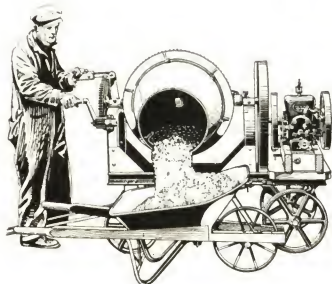
HAND MIXER
Pays for itself in 7 days



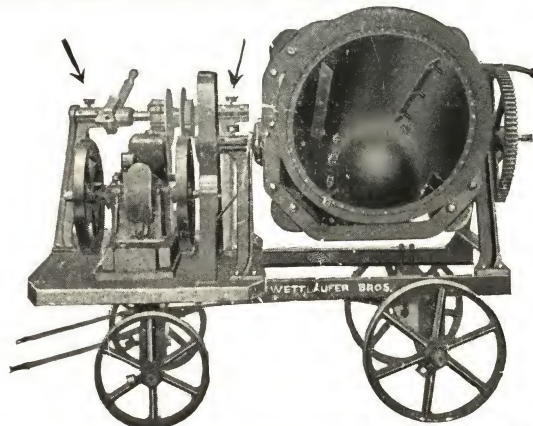
FAMOUS HEART-SHAPE TILTING DRUM CONCRETE MIXER
BUILT IN ALL SIZES. 6 TO 24 CU. FT. TO THE BATCH



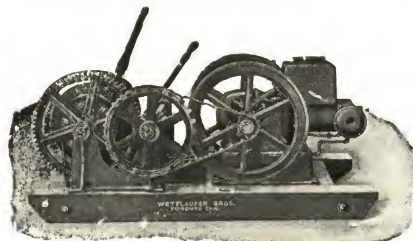
LATEST IMPROVED CRUSHER. REDUCES 3-IN. AND SMALLER ROCK TO SAND IN ONE CRUSHING. ADJUSTABLE WHILE RUNNING. ALL SIZES AND CAPACITIES.



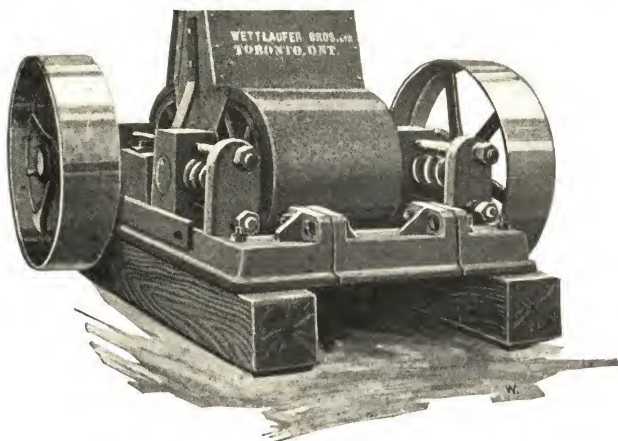
O-JUNIOR CONCRETE MIXER



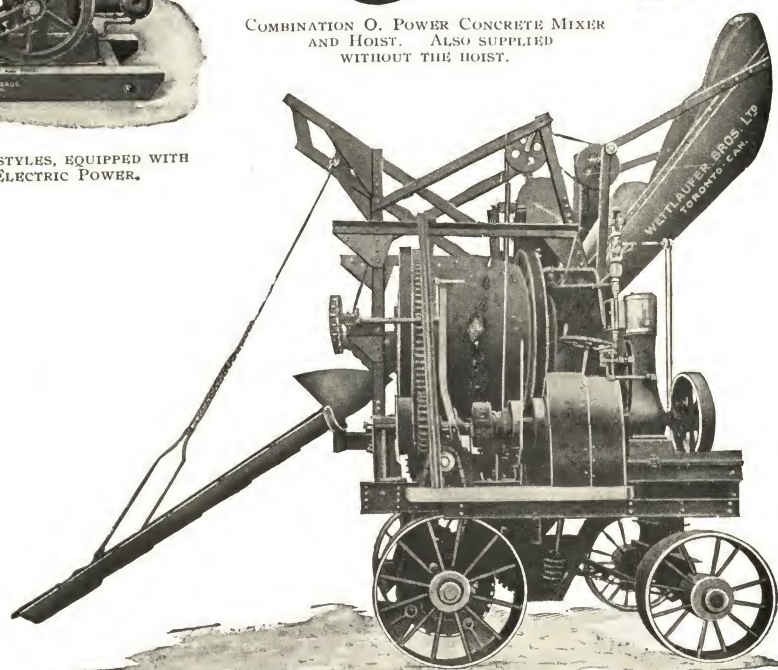
COMBINATION O. POWER CONCRETE MIXER AND HOIST. ALSO SUPPLIED WITHOUT THE HOIST.



HOISTS ALL SIZES AND STYLES, EQUIPPED WITH STEAM, GAS OR ELECTRIC POWER.



LATEST IMPROVED CRUSHING OR PULVERIZING ROLLS.
FROM 36 TO 4000 TONS PER 10 HOURS



LATEST MODEL ROAD PAVING CONCRETE MIXER.
Built in two sizes. Side view showing hopper up discharging into drum.

INFORMATION

Our new Catalogue with prices and full information will be forwarded upon request.

THE CANADIAN PATENT SCAFFOLDING CO., LIMITED

522 FIFTH AVE., ROOM 831
NEW YORK.

CANADIAN AGENTS:
ALEX. BREMNER, LTD.,
Montreal
BUILDERS' SALES, LTD.,
Ottawa
PRUNEAU & Co.,
Quebec

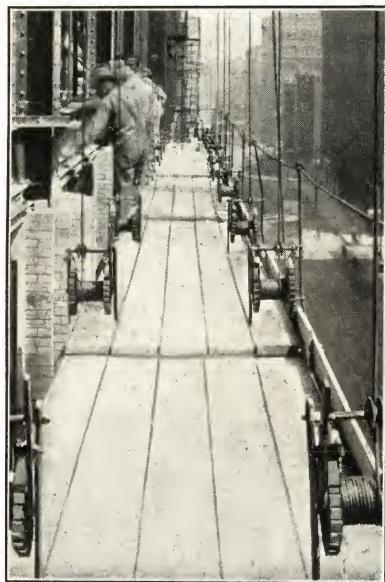
MANUFACTURERS AND LESSORS OF
SAFETY SCAFFOLDING MACHINES
FOR SUSPENDED SCAFFOLDS

—AND—

SAFETY HOISTING MACHINES
FOR SWINGING SCAFFOLDS.

CANADIAN AGENTS:
DRUMMOND & REEVES, LTD.,
Toronto

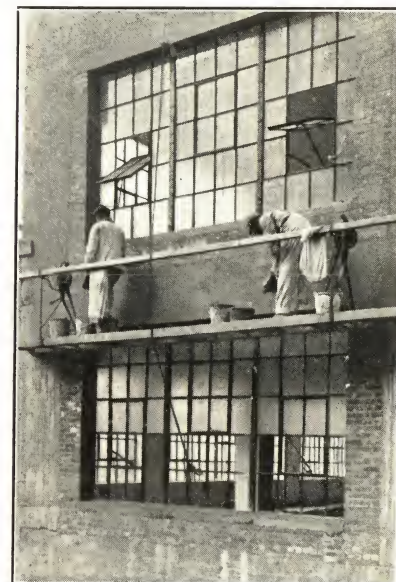
GORMAN'S, LTD.
Calgary, Vancouver, and Edmonton
BUILDING PRODUCTS & COAL CO., LTD.,
Winnipeg.



Showing suspended scaffold equipped with Safety Scaffolding Machines.



Showing Safety Scaffolding Machines equipped with Overhead Protection Attachments.



Showing Swinging Scaffold equipped with Safety Hoisting Machines.

USES OF SAFETY SCAFFOLDING MACHINES.

For erection of brick, terra cotta and stone on steel and concrete frame structures. For interior and exterior wheeling scaffolds. For adjustable suspended runways. For lining or facing of steel stacks. For plastering and stucco work.

ADVANTAGES OF SAFETY SCAFFOLDING MACHINES.

They provide a scaffold which can be raised and lowered rapidly. They effect *economy*, due to the fact that they eliminate shifting of workmen, scaffold supports and planks from floor to floor as work progresses; also by reason of the efficiency which can be produced by men working continuously at a convenient position and upon secure footing. Due to their simplicity of construction and numerous inherent safety features they provide a scaffold which is practically "fool-proof," thus eliminating the hazard which is involved in the use of other types of scaffolding.

DESCRIPTION OF SAFETY SCAFFOLDING MACHINES.

Each machine consists of steel Outrigger I-beam, anchor bolt for tying down outrigger I-beam, two hoisting drums or windlasses, two shackles for securing cables to outrigger I-beam, metal putlog for supporting scaffold planks and either guard rail support or overhead protection attachment. Each part is constructed of the best material, and is thoroughly and regularly tested. The machines are locked at all times by automatic steel pawls and cannot slip or run down. All working parts are exposed and open for inspection while the machines are in operation.

USES OF SAFETY HOISTING MACHINES.

For pointing up brick or stone. For cement finishing, plastering and stucco work. For erecting stone. For waterproofing. For cleaning and washing down brick and stone work.

ADVANTAGES OF SAFETY HOISTING MACHINES.

They eliminate the rope tackle formerly used for operating swinging scaffolds, thus removing the hazard which is always present where hemp rope is used. They are not affected by weather, fumes, and chemical compounds used for cleaning brick and stone work. They are light and compact, easily and economically installed and operated. They are locked at all times and cannot slip or run down. The steel wire rope with which they are equipped will stand maximum load of over 5000 pounds. The wire rope winds compactly onto small drum, leaving nothing dangling to the ground or to be coiled on the scaffold as in the case of rope tackle, thus effecting the minimum of obstruction on the scaffold.

DESCRIPTION OF SAFETY HOISTING MACHINES.

These machines are provided with a ratchet mechanism for raising, and worm and gear mechanism for lowering. Machines are equipped with steel wire rope for drops of 100 to 200 feet.

HOCKING VALLEY FIRE CLAY CO.

CANADIAN AGENTS

DRUMMOND & REEVES, LIMITED,
TORONTO, ONT.

WM. COPP, LONDON, ONT.

N.G. DE HAAS, SAULT STE. MARIE, ONT.

MANUFACTURERS OF SALT GLAZED BRICK
NELSONVILLE, OHIO.

CANADIAN AGENTS

HYDE & SONS, MONTREAL, QUE.

R.Y. KILVERT & Co.,
WINNIPEG, MAN.

OTTAWA FIREPROOF SUPPLY CO., OTTAWA, ONT.

PRODUCTS.

ATHENA SALT GLAZED BRICK.

ATHENA SALT GLAZED BRICK, EVERWEAR PAVING TILE, SANITARY FLOOR BRICK.

SIZE—8" x 3 $\frac{7}{8}$ " x 2 $\frac{1}{4}$ ".

SHADE NUMBERS, ETC.—Made in beautiful shades of mahogany (102), golden (104), buff (103), thoroughly vitrified and salt glazed on both faces and ends, and rich in both color and glaze. All standard shapes carried in stock and special shapes made on order.



CANADIAN PACKING COMPANY, PETERBOROUGH, ONT.

INTERIOR USES.—For facing entire interior walls or wainscot work wherever sanitary conditions are desired. Principal places: schools, hospitals, gymnasiums, swimming pools, stables, garages; office, factory and warehouse buildings; prisons, power plants, city market houses; acid rooms and vats; fire engine houses, packing plants; subways, passenger and freight depots.

FEW IMPORTANT JOBS (INTERIOR):

Wm. Davies Co., Limited, Toronto, Ont.
Municipal Incinerator, Toronto, Ont.
Dundurn Street Hydro Station, Hamilton, Ont.

Crescent Creamery Co., Winnipeg, Man.
Swift-Edmonton Co., Edmonton, Alta.
World's largest Electric Generating Station, United Electric Light & Power Co., 201 St., New York; 650,000 brick used.

EXTERIOR USES.—For facing all exterior walls where a beautiful sanitary and permanent wall is desired, and not affected by acids or the elements. These bricks have been furnished for exterior facing in almost every conceivable class of building, including many apartment buildings in all principal cities.

EVERWEAR PAVING TILE.

SIZE—10 x 5 x 2 $\frac{1}{4}$ ". Extensively used for paving floors of engine and boiler rooms, power and industrial plants, basements of public buildings, schools, warehouses and battery rooms, paving around electric and steam railway passenger and freight depots. Thoroughly vitrified and only one side glazed, and unsurpassed for beauty and wearing qualities. 50% saving over cement floors on original cost, and with many times the life of a cement floor. These tile have been upon the floors of boiler and engine rooms of the New York Life Insurance Building, New York, for 20 years and show scarcely any wear.

FEW OF MANY CONCERNS USING SAME:

Bank of Toronto (Boiler Room), Toronto, Ont.
Chicago Edison Electric Co., Chicago, Ill.

Cleveland Electric Railway Co., Cleveland, Ohio.
Ford Motor Co., Detroit, Mich.

SANITARY FLOOR BRICK.

SIZE—8 $\frac{1}{4}$ x 4 x 1 $\frac{3}{8}$ ". This product is usually embedded in cement and adapted to practically the same class of floors as those above named for our Everwear Paving Tile, but where the desire is for lighter weight material. Especially desirable in packing house floors, and is being used extensively for such purposes. Only one side is glazed and either side can be turned up as desired.

A FEW SPECIAL JOBS:

Canadian Packing Company, Peterborough, Ont.
Swift-Canadian Company, Toronto, Ont.
William Davies, Ltd. (Packing Plant), Toronto, Ont.

Canadian Packing Company, Hull, Que.
Harris Abattoir Company, Toronto, Ont.

GENERAL QUALITIES OF SALT GLAZED MATERIAL.

SAMPLES AND FACILITIES.

All shades of the standard brick and three classes of floor brick are burned to about 2,200 deg. Fahr.; thoroughly vitrified and salt glazed; absolutely acid-proof; non-absorbent of moisture; will not craze, crack or peel; withstand all the elements of the air besides heavy crushing strain, and always look fresh and clean.

Communicate with us, and we will direct the nearest sales agency to submit samples and prices at once. With a daily capacity of 50,000 brick, or approximately 15,000,000 annually, and a large and well selected stock for quick shipment, all business is given prompt attention.

THE DON VALLEY BRICK WORKS

HEAD OFFICE, DOMINION BANK BUILDING,
TORONTO, ONT.

MONTREAL AGENT:
DAVID MCGILL,
320 LAGAUCHETIERE STREET.

WORKS:
DON VALLEY, TORONTO.

PRODUCTS.

We are the largest manufacturers in the Dominion of High-Grade BURNT CLAY PRODUCTS, and have exceptional facilities for turning out PRESSED BRICKS, ENAMELLED BRICKS, ordinary KILN RUN STOCK BRICKS and TERRA COTTA HOLLOW TILES for fireproofing.

PRESSED BRICKS.

Our Standard Red and Buff Pressed Bricks are of the highest grade, and we are prepared to supply Bricks for special work that are selected from the finest stock.

SPECIAL BRICKS.

We carry in stock large quantities of Bullnoses and Base Bricks, and are prepared to make Specially Moulded Bricks or Arch Bricks from Architects' drawings.

STOCK BRICKS.

We also manufacture and carry large quantities of Red and Gray Stock Bricks of excellent colour, hard-burned, with faces and arrises true.

CLINKER BRICKS.

We make hard-burned Clinker Bricks, vitrified throughout, suitable for paving and heavy foundations.

SIZES.

Standard size Pressed Bricks, approximately: Red, $8\frac{3}{8} \times 2\frac{3}{8} \times 4\frac{1}{8}$; Buff, $8\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{4}$.

Standard size Stock Bricks, approximately: $8\frac{5}{8} \times 2\frac{1}{2} \times 4\frac{1}{4}$.

FACILITIES.

Our facilities are exceptional for turning out first-class material. The extensive clay-beds in the Don Valley are so widely known as being one of the few clay deposits that are suitable in quality, free from lime, and having the necessary ingredients to form a good Brick.

CAPACITY.

Our total annual capacity is 75,000,000; we always carry a large stock and can fill orders promptly. We have excellent shipping facilities and will be pleased to quote prices, including freight.

We will gladly supply samples of our bricks to prospective users, express prepaid.

ENAMELLED BRICKS.

We manufacture High-Grade ENAMELLED BRICKS in the following colours: Yellow, Brown, Chocolate, Sage Green, Light Green, Dark Green, Cobalt Blue, Robin's Egg Blue, Dark Blue, Light Buff, Dark Buff, Granite, Mottled, Black Manganese, White and Red.

UNIFORMITY OF SHADES.

We guarantee uniformity of shades.



ADAPTABILITY.

Enamelled Bricks are used where light and cleanliness are essential; for instance, Light Shafts and Courts, Elevator Shafts, Bakeries, Restaurants, Markets, Subways, Tunnels, Railway Depots. Fire Engine Houses, Bank Vault Interiors, Sanitariums, Mausoleums, Stables, Swimming Pools, Turkish Baths, Kitchens, Laundries, Smoking Rooms, Power Houses, etc.

SPECIAL SHAPES AND COLOURS.

We are at all times pleased to make special and ornamental Enamelled Bricks in any colours or shapes desired by Architects to fill peculiar conditions, and invite correspondence in regard to same.

See also our advertisement on pages 22-23

AMERICAN ENAMELED BRICK AND TILE CO.

(INCORPORATED 1893.)

MANUFACTURERS OF
ENAMELED AND FIRE BRICK.

52 VANDERBILT AVE.,
NEW YORK, N.Y.

DEALERS IN FACE BRICK
OF ALL COLORS AND TEXTURES.

AGENTS IN ALL PRINCIPAL CITIES OF THE UNITED STATES, AND IN

MONTREAL, OTTAWA, TORONTO, HAMILTON, LONDON, WINDSOR, WINNIPEG, CALGARY AND VANCOUVER, CANADA.

PRODUCTS.

ENAMELED BRICK White, Mottled and Standard Colors in Standard Sizes and Ornamental Shapes. (See plates.) We are the largest manufacturers of this commodity in North and South America.

FIRE BRICK, Standard 9 in. and 9 in. Series Shapes, as adopted by the Members of the Refractories Manufacturers Association, and Special Shapes.

FIRE CLAY, packed in bags or in bulk.

FACE BRICK, all colors and textures.

TERRITORY.

The business operations of this firm cover North and South America, Europe, Asia and Australia.

PERSONAL REPRESENTATIVES.

For the convenience of our customers in the United States and Canada, we have, in order to keep in closer touch with them, located representatives in all the principal cities to attend personally to inquiries, orders and deliveries.

DISPATCH OF SHIPMENTS. SHIPPING FACILITIES.

Factory and office are in constant telephone connection with each other, and we have a local telephone exchange connecting every department of the factory for quick and systematic dispatch of business.

Our works, located but an hour's travel from the New York Office, are situated so as to enable shipping over two of the largest railroads, viz., the Pennsylvania and the Central of New Jersey, and their connecting lines. We are also situated on tide water, so that shipments can be made by vessel for the coastwise and export trade.

PRECAUTION AGAINST DELAY.

Every part of our factory, including machinery, has its duplicate, which prevents any possibility of delay caused by breakdowns, should they occur.

CAPACITY.

Our present capacity is 12,000,000 brick per annum, which will be increased as occasioned by the demand.

STOCK.

The average stock on hand at our factory is more than 2,000,000 brick, giving a large assortment for immediate shipment.

ILLUSTRATIONS OF STOCK

Much delay is saved by use of stock design of moulded brick.

DESIGNS OF

In the following pages are shown designs that we recommend as being most satisfactory in manufacturing results.

ENAMELED BRICK.

We try to keep a stock of these on hand, in standard colors.

These designs are chosen to reduce manufacturing difficulties and delays to a minimum; to enable composite mouldings to be made up; and to enable prompt filling of orders.

DETAILS REQUIRED FOR SPECIAL ENAMELED ARCH BRICK WORK.

When ordering special arches, please consult the accompanying cuts and give all necessary information as to details. Furnish details as long as possible in advance of time the arches will be required. We should be allowed from four to six weeks' time to make up arch brick to conform with detail. We keep no arches in stock.

We cannot always guarantee uniformity of shade in arches as in regular deliveries of first quality plain stock brick, therefore strongly recommend the use of stock specials for lintels of doors and windows. (See study of window opening on third page.)

COLORS—

BRIGHT, MEDIUM
OR MATT FINISH
ENAMEL.

In addition to our regular white and standard colors, such as our sage green, red brown, etc., we have made a specialty of mottles in the following colors:

Gray, brown, black, blue and blue brown, which give a very fine appearance for both interior and exterior work, having a finish more on the type of marble than enameled brick.

If you have in mind, at any time, a particular color, shade or finish of enameled brick for interior or exterior purposes, advise us your ideas and requirements and we will be pleased to submit samples.

UNIFORMITY OF SHADE OF ENAMELED BRICK.

We guarantee uniformity of shade in all first quality deliveries to the limit of practicability. Colors and effects giving most uniform results are, in order of degree of uniformity, white, mottled gray, mottled brown, mottled black, sage green and red brown. Other colors follow in irregular positions.

We will try on orders of moderate size, or on larger orders, if ample time be given, to match in shade the moulded and stretcher stock, but cannot always guarantee to uniformly shade shipments of specials, particularly on rush shipments.

SPECIAL FEATURES AND ADVANTAGES OF OUR ENAMELED BRICK.

In making our product we follow the English and Scotch systems, working by the soft mud process. This is without question the only process which insures durability and the closest relation of bond obtainable between body and glaze.

Our brick are burnt in but one fire, thus making the chemical change in the body and the glaze simultaneous.

Where manufacturers use the dry pressed process, the brick have to be burnt first as front brick before the enamel can be applied, and fired again for the fluxing of the glaze.

Where the enamel is applied on an already burnt brick and fluxed in a second fire, the bond is weak and peeling is sure to follow.

We use hard and durable glazes, not soft lead glazes frequently seen on inferior grades of enameled brick and tile.

There has not been a single case during our twenty-nine years of business where any peeling or discoloring has been seen or reported.

This is better than any guarantee which we might be asked to give, as it covers a distributed output of over 120,000,000 brick, located all over the United States and elsewhere and subject to all varieties of climatic conditions.

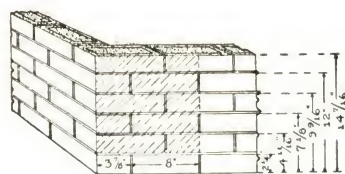
CLEANING.

Enameled Brick are best cleaned with some alkaline solution, such as caustic soda or sodium carbonate. This cleans the enamel and does not affect the cement or lime mortar.

ACIDS.

Sulphuric, nitric, or hydrochloric acids, even in concentrated form, will not affect our glazes; but if used as a wash, even when diluted, they will attack the cement or lime mortar.

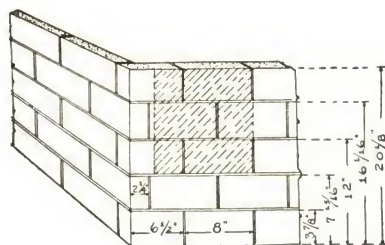
The only commercial acids which will attack and destroy our enamel are hydrofluoric and hydrofluorsilicic.



STANDARD SIZE,

7 1/2 STANDARD BRICK WITH
3/16" JOINT = 1 SQ FOOT
5 COURSE/ PER LINEAL FOOT

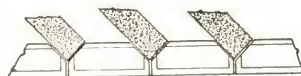
4 2/3 FLATTER BRICK WITH
3/16" JOINT = 1 SQ FOOT
3 COURSE/ PER LINEAL FOOT



FLATTER SIZE

COMPARISON OF SIZES SHOWING
NUMBER OF BRICKS PER SQUARE FOOT
All dimensions are approximate.

CLIPPED BOND



PLAN

THE ENAMELED BRICK ARE CLIPPED ON BACK BY MASON TO RECEIVE THE COMMON BRICK

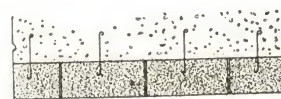
HEADER BOND



PLAN

ENAMELED BRICK HEADERS USED TO BIND ENAMELED BRICK WITH COMMON

WALL TIE BOND

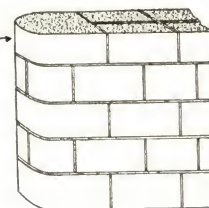


PLAN

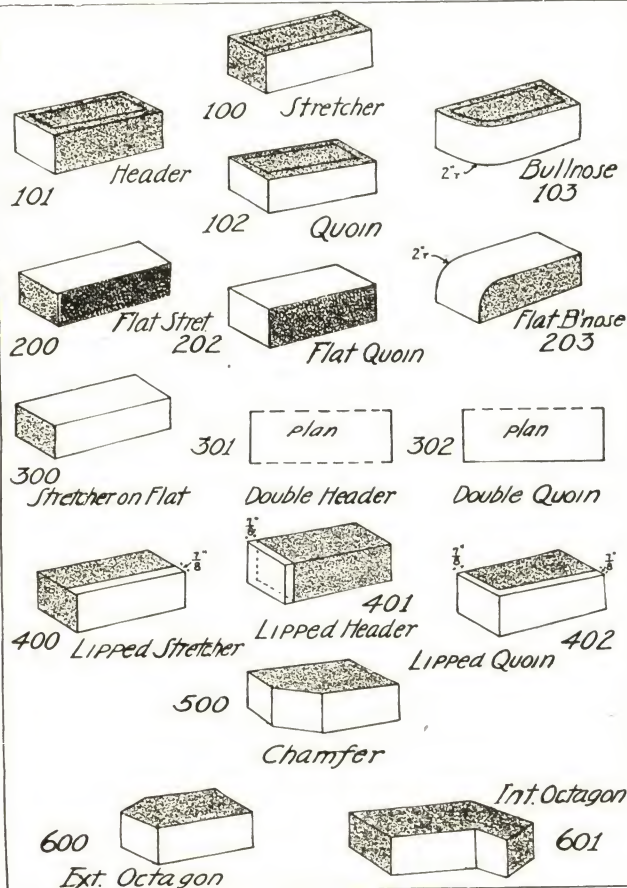
WALL TIE/ USED TO BIND ENAMELED BRICK WITH CONCRETE

DOUBLE FACE FLATTER WALL

BINDER

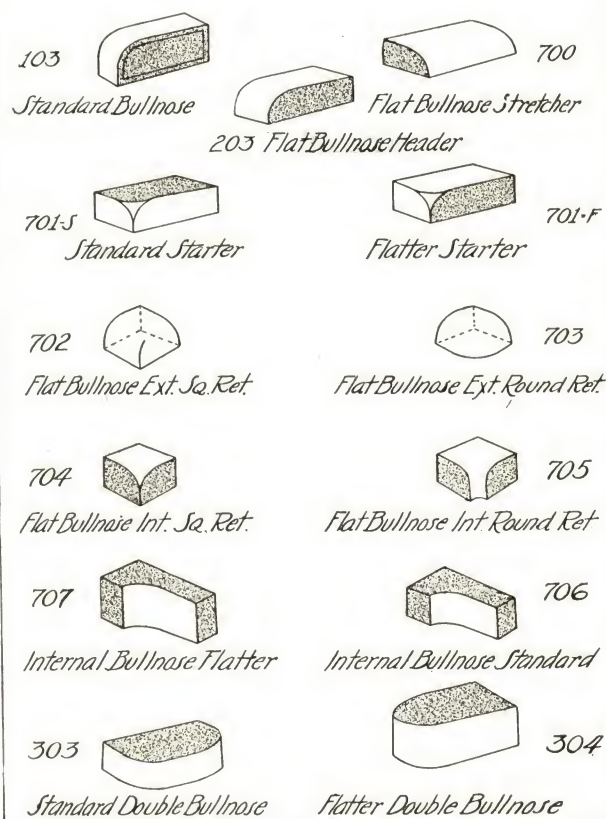


SYSTEM OF BONDING OR TYING ENAMELED BRICK
TO COMMON BRICK OR CONCRETE BACKING, also
METHOD OF BONDING FLATTER BRICK FOR PARTITIONS



ILLUSTRATIONS OF TYPES

For projection and dimensions see next page.

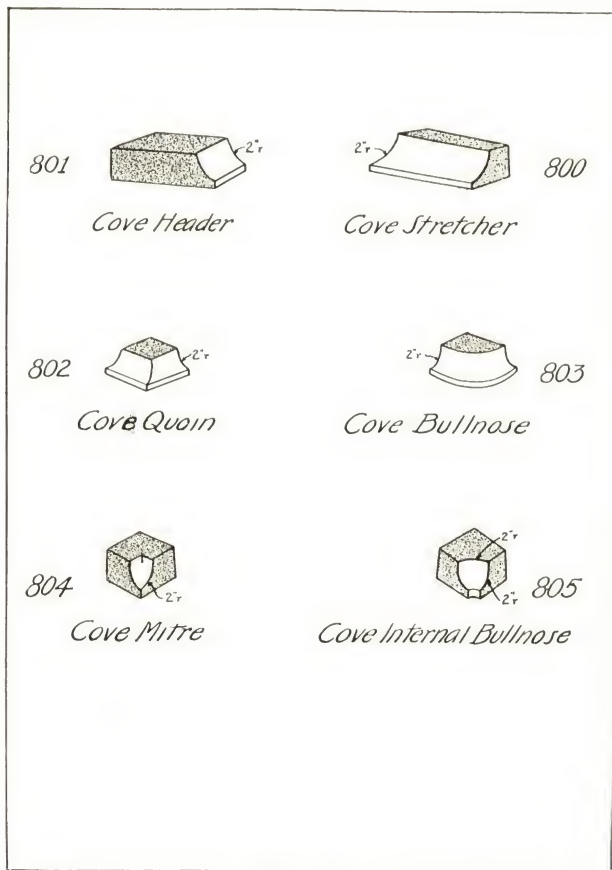


BULLNOSE SPECIALS

For projection and dimensions see next page.

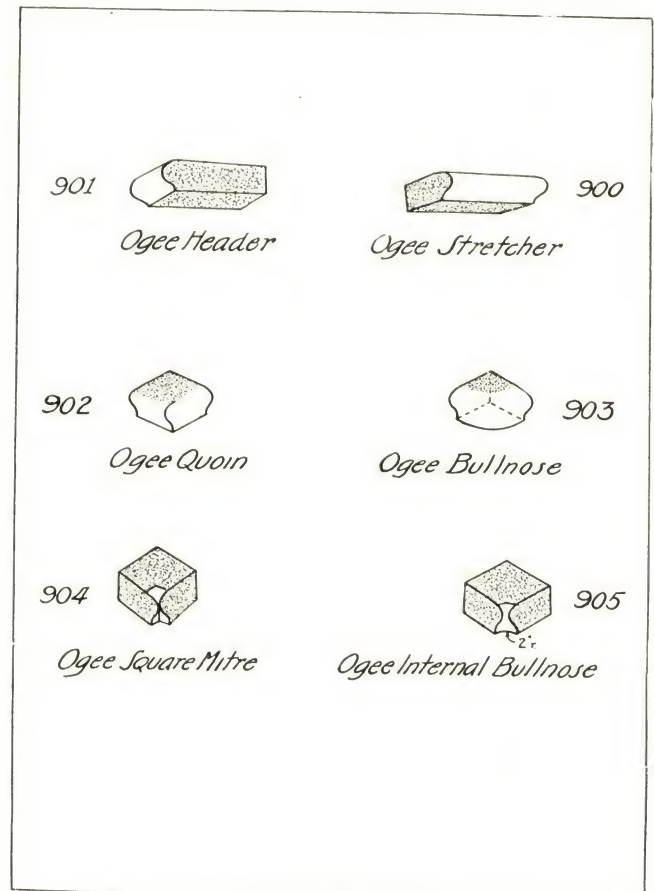
All Brick shown have 2-inch Radius.

CONTINUED ON NEXT PAGE



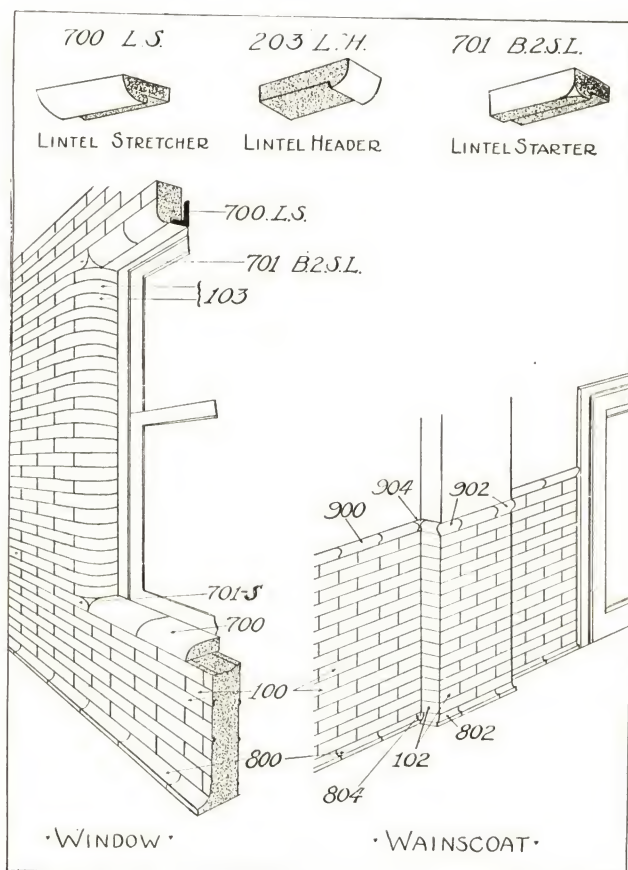
COVE MOULD

For projection and dimensions see cut below.



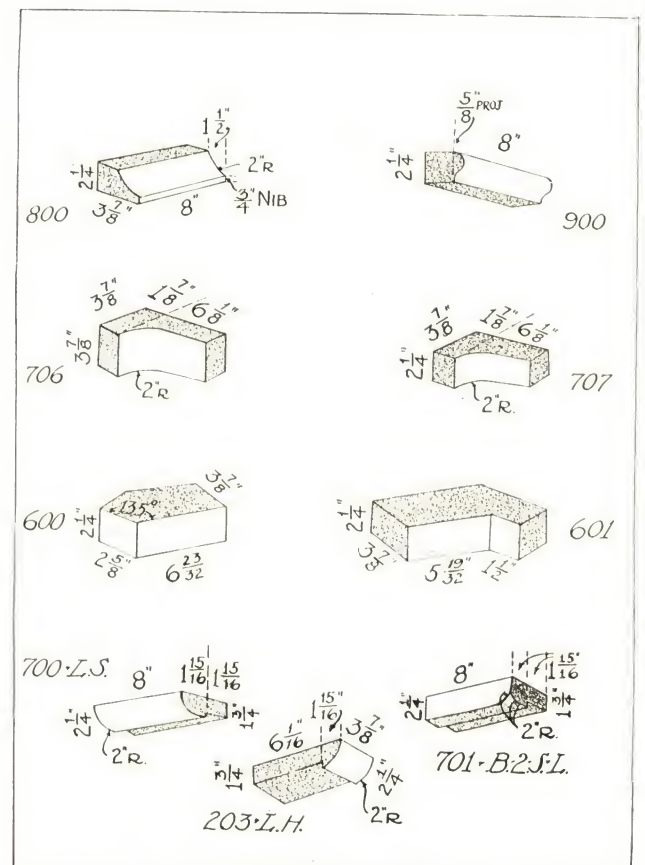
OGEE MOULD

For projection and dimensions see cut below.



STUDY OF A WINDOW OPENING

STUDY OF A BASE AND CAP COURSE



PROJECTION AND DIMENSIONS OF SPECIAL SHAPES

FEDERAL TERRA COTTA CO.

101 PARK AVENUE (ARCHITECTS BUILDING), NEW YORK.

BOOK BUILDING, DETROIT, MICH.

MANUFACTURERS OF THE SUPERIOR GRADE OF
ARCHITECTURAL TERRA COTTA.

REPRESENTED BY

JOHN LINDSAY, 34 Victoria St., TORONTO.
B. & S. H. THOMPSON Co., LTD., MONTREAL.

FACTORY: WOODBRIDGE, N.J.

EAGAR, COOMBS & Co., LTD., HALIFAX.
MONCTON SUPPLY Co., MONCTON.

PRODUCT.

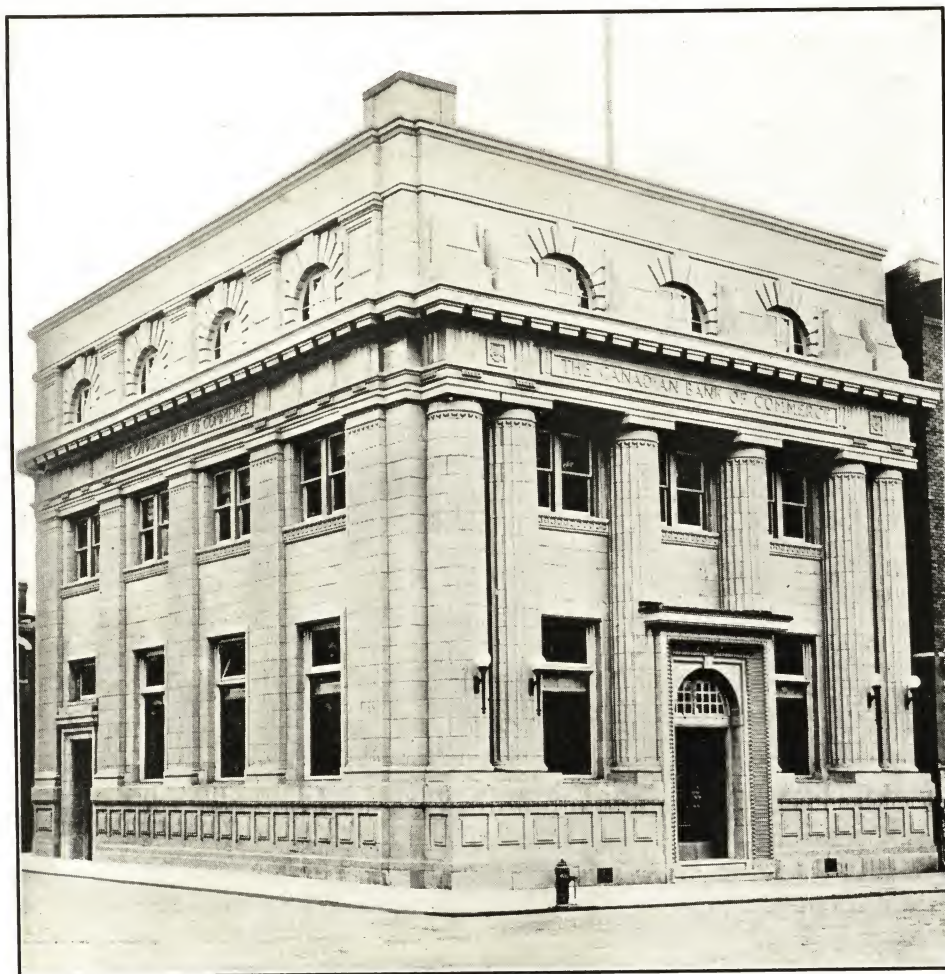
ARCHITECTURAL TERRA COTTA for EXTERIOR and INTERIOR USE in complete lines of unglazed standard colours, such as gray, buff, red, etc., with hard-burned vitreous surface; matt and full glazed white, cream, and polychrome finish; all finishes are hard-burned and impervious to weather conditions, and permanently durable.

SPECIALTIES.

TERRA COTTA GRANITE and TERRA COTTA MARBLE, reproducing exactly the colour, texture and general appearance of the natural material. Samples furnished upon request.

SERVICE.

Samples and development of preliminary drawings to show adaptability of Terra Cotta and construction.



CANADIAN BANK OF COMMERCE, BELLEVILLE, ONT.

V. D. HORSBURGH, F.R.I.B.A.

Facades above Base Course of FEDERAL TERRA COTTA, with Vitreous Surface, in Limestone Colour.

OTHER REPRESENTATIVE CONTRACTS.

BUILDING.	LOCATION.	ARCHITECT.	BUILDING.	LOCATION.	ARCHITECT.
Ritz Carlton Hotel.....	Montreal.....	Warren & Wetmore.	Real Estate Exchange.....	Detroit.....	Louis Kamper.
Metropolitan Bank.....	Toronto.....	Darling & Pearson.	Equitable.....	New York.....	Ernest R. Graham.
Central Technical School.....	Toronto.....	Ross & MacDonald.	Biltmore Hotel.....	New York.....	Warren & Wetmore.
Bishop Street Apartment.....	Montreal.....	Charles A. Mitchell.	Canadian Bank of Commerce.....	Vancouver.....	V. D. Horsburgh.
Union Bank.....	Toronto.....	Bond & Smith.	Royal Connaught Hotel.....	Hamilton.....	Esenwein & Johnson.
Imperial Bank.....	Toronto.....	Darling & Pearson.	Bank of Nova Scotia.....	St. John's, N.F.....	Darling & Pearson.

INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION

P.O. BOX 600.

BEDFORD, INDIANA.

Representing the following quarry operators in the Bedford-Bloomington District, producers of the well-known INDIANA OOLITIC LIMESTONE (sometimes called "Bedford Stone"):

Bloomington-Bedford Stone Co. -	Bloomington, Ind.	Indiana Quarries Co. - - -	Bedford, Ind.
Chicago & Bloomington Stone Co.	Bloomington, Ind.	J. Hoadley & Sons Co. - - -	Bloomington, Ind.
Consolidated Stone Co. - - -	Bedford, Ind.	Mathers Stone Co. - - -	Bloomington, Ind.
Crescent Stone Co. - - -	Bloomington, Ind.	Monroe County Oolitic Stone Co.	Bloomington, Ind.
Empire Stone Co. - - -	Bloomington, Ind.	National Stone Co. - - -	Bloomington, Ind.
Furst-Kerber Cut Stone Co. - -	Bedford, Ind.	Perry Stone Co. - - -	Ellettsville, Ind.
Geo. Doyle Corporation - - -	Bedford Ind.	Shea & Donnelly Co. - - -	Bedford, Ind.
Hunter Bros. Stone Co. - - -	Bloomington, Ind.	Star Stone Co. - - -	Bloomington, Ind.
Imperial Stone Co. - - -	Bedford, Ind.	W. McMillan & Son - - -	Bedford, Ind.



PRODUCTS.

GRAY (or "blue"), BUFF and VARIEGATED (or "mixed") INDIANA LIMESTONE. In addition to the classification by color, the stone is further classified by texture, as follows:—

"SELECT." Uniform fine grain; most suitable for carving, interior and special work, and of a finer texture than generally required for average exterior work.

"STANDARD." The grade most frequently used for exterior work, both plain and monumental, and for all general purposes. The grade that is always furnished unless another grade is clearly specified.

"RUSTIC." (Buff only.) Distinctly variable in texture and less uniform in color than the "standard" variety. Specially suitable for use where antique or rustic effects are wanted and for residences and other buildings where the effect is more dependent upon texture and tone than upon carving and tooled work. Also used very extensively for heavy cornices and other work placed at some elevation above the eye.

"RANDOM ASHLAR." Rough sawed-four-side Quarry-run Indiana Limestone of short length stock is one of the specialties furnished for Random Ashlar wall facing.

COST.

The present cost of this material compared with substitute products is such as to make it economically available for use in all classes of buildings, including most ordinary commercial structures, school buildings and moderate sized residences, as well as in the more monumental work for which a natural stone is always used.



Transportation Bldg., Montreal.
ROSS & MACFARLANE, ARCHITECTS.



Drummond Bldg., Montreal.
H. C. STONE, ARCHITECT.

SERVICES.

The services rendered by this Association are both promotional and educational and comprise general publicity, investigation and research work, technical service and assistance to the Architectural profession and to the Trade, for which purpose an Architects' Service Bureau is maintained. Standard Specifications, construction details, data on setting mortars and cleaning, and other information will be furnished gratis upon request.

LITERATURE AND SAMPLES.

Literature of considerable value to Architects in the form of service publications, including technical information, construction details and service plates, etc., is constantly being prepared and as published will be furnished free to those requesting same.

Samples of the stone will also be cheerfully furnished to architects and others interested.

The Cut Stone Specifications for Indiana Limestone, as published in this edition of SPECIFICATION DATA, have now been finally revised and issued in both loose leaf and booklet form and will be sent upon request to Architects in Canada. Considerable information and data of interest to both architects and the trade will be found in the booklet edition. Architects should also obtain copy of the Association (Masonry) Specifications for Random Ashlar Wall Facing.

INQUIRIES FOR CURRENT ISSUES OF LITERATURE ARE SOLICITED.

PHYSICAL CHARACTERISTICS.

Indiana Limestone is NOT CRYSTALLINE; the aggregate, filler and matrix are all pure carbonate of lime.

CHEMICAL ANALYSIS (AVERAGE).

Carbonate of Lime.....	97.26
Silica.....	1.69
Oxide of Iron.....	.49
Magnesia.....	.37
Water and Loss.....	.19

100.00

While not a hard or brittle stone it can be split with equal ease in any direction and for all practical purposes is considered a free stone, having no evidence of grain. It possesses far greater strength than required for any ordinary building purposes having an average crushing strength of more than 8,000 lbs. per square inch and a remarkably uniform modulus of rupture whether tested parallel to or at an angle with the grain, making it safe for long lintels, etc., and also making it unnecessary to always set the stone on its natural quarry bed. In spite of its great strength no other commercial stone is so easily worked.

Indiana Limestone is to all intents and purposes fireproof. It calcines above 1,500 degrees F., and will not spall, crumble, split or check at temperature up to 1,000 degrees F. when drenched with cold water.

It possesses a wonderful internal elasticity, adapting itself without damage to extreme temperature changes and other conditions of permanence that exist in modern building structures, and for this reason alone is particularly well adapted to use in Canada and the colder northern sections of the U.S.A.

PERMANENCE.

Its durability and resistance to atmospheric action is proven by the exposed quarry ledges that are centuries old and by existing structures of considerable age. Its soft light color tones are permanent, and no other building material remains clean so long or better resists the accumulation of grime from the smoke laden atmosphere of manufacturing cities. Many fine monumental and commercial buildings in Canada may be referred to as attesting the beauty, adaptability, permanence and genuine value of this fine natural building stone.

FINISHES.

Any hand tooled or machine finish, including rubbing, may be applied; but bush hammering and other so called "Hard Stone" finishes are rarely used, except for special purposes.

AVAILABILITY TO ALL PARTS OF CANADA.

Stone for the largest operation can be promptly delivered. The vast supply of the deposit and thoroughly modern quarry and mill equipment give unequalled facilities for rapid production on a large scale. Blocks of any size, including monolithic columns up to 40' 0" in length, may be obtained.

Transportation connections from the quarries to all Canadian points are excellent, and good sized stocks of this stone are also carried by the Cut Stone Trade in Canada.



MACDONALD HOTEL, EDMONTON.

ROSS & MACDONALD, ARCHITECTS.

PARTIAL LIST OF REPRESENTATIVE INDIANA LIMESTONE BUILDINGS IN CANADA.

Drummond Building, Montreal.
Transportation Building, Montreal.
Dandurand Building, Montreal.
Bank of British N.A., Edmonton
Registry Building, Toronto.

Imperial Oil Building, Toronto.
Journal Building, Edmonton.
Chateau Laurier Hotel, Ottawa.
Fort Garry Hotel, Winnipeg.
C.P.R. Palisser Hotel, Calgary.

Macdonald Hotel, Edmonton.
Empress Hotel, Victoria.
Union Station, Ottawa.
Union Station, Toronto.
Interior work, Parliament Bldgs., Ottawa.

Many of the fine bank buildings, both large and small, housing the leading Canadian banking institutions and their numerous branches are also built of Indiana Limestone.

In addition to the buildings that are entirely faced with Indiana Limestone, this material has also been used extensively in Canada for the trim of school, commercial and residence buildings.

MILLS :
ST. MARY'S, ONT.

CAPACITY :
1,000,000 BARRELS ANNUALLY.

ALFRED ROGERS, LIMITED

85 BAY STREET
TORONTO, ONT.



UNIFORMLY
HIGH QUALITY.

Rogers' Cement is scientifically prepared under the strictest supervision, to insure exact proportioning, absolute uniformity and the highest possible quality. Rogers' is everywhere recognized as a cement of superior quality, strength and durability.

STRENGTH.

Rogers' Cement does not weaken after 28 days. It grows stronger with age—continually, indefinitely.



HYDRO ELECTRIC POWER DAM, EUGENIA FALLS, ONTARIO.
BUILT BY AMBURSIN HYDRAULIC CONSTRUCTION CO. OF CANADA, LIMITED, MONTREAL. ROGERS CEMENT USED EXCLUSIVELY.

OUTSTANDING
EXAMPLES.

The superiority of Rogers' Cement is proved by the many cases in which it has been successfully used in important construction work.

Outstanding examples of these are:—

BUILDINGS.

New Government House, Toronto; Power Dam, Eugenia Falls; Royal Bank Building, Toronto; C.P.R. Building, Toronto; C.P.R. Elevator, Midland; Don Section, Bloor St. Viaduct, Toronto; New Bridge over Red River, Winnipeg; 16,000 Hydro Electric Cement Poles, and hundreds of others. In fact, those best qualified to judge cement on its merits are convinced of the superiority of Rogers' Cement.

ROADWAYS.

Pyramid Cement has been tested and approved for use on the roadways to be constructed in the following towns and cities:—

Galt.
St. Thomas.
Stratford.
Niagara Falls.
Meaford.
Walkerton.

Dundas.
Woodstock.
Wallaceburg.
St. Catharines.
Brantford.
Guelph.
Orillia.
Bothwell.
Elmira.
Kitchener.
Sarnia.

DISTRIBUTORS
FOR

SUPER CEMENT
Waterproof—Absolutely

THE PRODUCT.

SUPER CEMENT is not a brand of ordinary Portland Cement. It is a distinct and different product—possessing many superiorities that it alone can claim.

MANUFACTURE.

SUPER CEMENT is made by a new and improved process, from a special formula, involving the addition of a specially treated gypsum to the cement clinker. This promotes a perfect combination of the cement and mixing water.

WATERPROOF-
NESS.

SUPER CEMENT does not need the addition of a waterproofing compound of any kind—it is an ABSOLUTELY WATERPROOF cement—because of its dense, homogeneous composition.

USES.

For all purposes where cement could be used, SUPER CEMENT is eminently satisfactory. Mortar, Stucco and concrete made from SUPER CEMENT possess increased strength, density, waterproofness, adhesion and durability.

THE TRUSCON LABORATORIES

FACTORY, WINDSOR, ONTARIO.

WATERPROOFINGS, DAMPPROOFINGS, PAINTS, VARNISHES.

CANADIAN DISTRIBUTORS: O. A. COLE, LIMITED, 311 KING ST. E. TORONTO.



WATERPROOFINGS AND DAMPPROOFINGS.

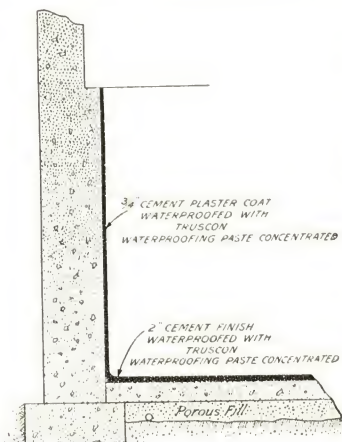
WATERPROOFING

Truscon Waterproofing Paste, Concentrated, is an integral waterproofing for concrete and cement stucco. Also for waterproofing concrete, brick or stone foundations, tunnels, reservoirs, etc., by the waterproofed cement plaster coat method.

Some of the largest and most prominent building operations in the world are permanently waterproofed by the Truscon method, notably the Grand Central Terminal, New York; General Motors Office Building, Detroit; Toronto Hydro-Electric System, Toronto; Canadian National Carbon Co., Limited, Toronto; Wm. Davies Co., Limited, Toronto; H. K. Wampole Co., Limited, Perth, Ont.

Truscon Waterproofing Paste has won its position in the field because it is the perfected waterproofing from both a theoretical and a practical engineering point of view. Furthermore, it is the most economical because less material is required. Consequently, it costs less per cubic yard of concrete.

SPECIFICATIONS.



WATERPROOFING CONCRETE OR MASONRY BY WATERPROOFED PLASTER COAT.

SPECIFICATIONS.

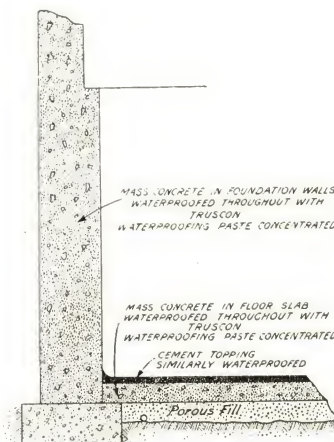
FOR WATERPROOFING MASS CONCRETE INTEGRALLY APPLICABLE TO CISTERNS, RESERVOIRS, FOUNDATIONS AND SIMILAR CONCRETE STRUCTURES.

METHOD.—Watertightness shall be secured by the addition of Truscon Waterproofing Paste, Concentrated, as manufactured by The Truscon Laboratories, to all water used to temper the dry mixture of cement and aggregate in the proportions specified and as supplied by the manufacturer.

SPECIFICATIONS.

FOR WATERPROOFING CONCRETE, STONE AND OTHER MASONRY STRUCTURES BY MEANS OF WATERPROOFED PLASTER COAT METHOD.

METHOD.—Watertightness shall be secured by plastering the interior surface of the structure with a continuous coat of Portland Cement mortar waterproofed with Truscon Waterproofing Paste, Concentrated, as manufactured and recommended by The Truscon Laboratories.



WATERPROOFING MASS CONCRETE.

DAMP PROOFINGS

TRUSCON
PLASTER BOND

TRUSCON
FOUNDATION COAT

TRUSCON
STONE BACKING

A special bituminous coating for dampproofing interiors of all exposed walls. Its use provides a continuous dampproofing element for all such walls over which plaster can be directly applied.

A liquid bituminous cement of heavy consistency adapted for dampproofing general substructural work under earth filling. No heating apparatus required.

A black dampproof coating for treating the unexposed sides of cut stone thereby preventing discoloration of the stone from elements in the mortar.

TRUSCON MAINTENANCE ENGINEERING SERVICE

"A MAINTENANCE PRODUCT FOR EVERY MAINTENANCE PURPOSE."

Every Manufacturing Plant, every Office Building, Hotel, Hospital, Apartment Block, etc., has a definite problem in its maintenance or up-keep. Interiors must be painted—exteriors must be protected against deterioration—and there is much varnishing and cleaning up to be done. On account of the exceptional manufacturing facilities of The Truscon Laboratories and our experience in handling such Maintenance Requirements, we are in a position to offer to every Architect, Engineer, Building or Plant Superintendent a valuable Service.

Whether your problem is that of oilproofing a concrete floor, splinterproofing a wood floor, obtaining a special paint to resist some acid or alkali condition, waterproofing a basement, or protecting exposed steel, Truscon Maintenance Engineering Service has a product for that, and every other Building Maintenance purpose.

Below are enumerated a few standard Truscon products and their particular uses. Your inquiries are solicited.

"A MAINTENANCE PRODUCT FOR EVERY MAINTENANCE PURPOSE."

The natural characteristic of concrete is to dust. Dusting is followed by sanding and crumbling. AGATEX is a chemical which hardens the concrete without changing its color or appearance. AGATEX is swept over a floor. The surface becomes so hard that it can scarcely be scratched with a knife.

Nothing does so much towards cutting down electric lighting bills as the use of a serviceable Mill White. Truscon INDUSTRIAL WHITE is a special light-reflecting paint. It stays white. It is more economical and advantageous than kalsomine. It can be washed and kept clean.

Steam heat dries out wood floors—causes them to splinter and wear away. Truscon Wood Floor PRESERVATIVE gives new life and toughness to a wood floor. It penetrates—and binds the woody fibres into a hard, tough, wear-resisting surface. Prevents decay where floors are subjected to wetting.

BAR-OX Inhibitive Coating is the coating that weathers and wears on Steel, because it is designed for that special purpose. On all exposed steel, such as bridge work, cranes, outdoor tanks, etc., BAR-OX Inhibitive Coating should be used for both shop and field coats.

Brick, stone, stucco, concrete and other forms of exposed masonry should be protected against the elements. They absorb moisture and moisture causes disintegration. STONETEX, the Nationally known masonry coating, dampproofs, protects and beautifies all such surfaces.

When soot, rust and grime have obtained such a firm hold on glass that they seem to have become a part of the glass, Truscon SKYLIGHT AND WINDOW CLEANER is the quickest remedy. Especially useful when applied to ribbed glass. Does not injure the paint or putty.

Painting the various pipes running along the walls and ceilings of an Industrial Plant in a distinctive color is a very common thing nowadays. Truscon PIPE IDENTIFICATION PAINT was especially designed for this purpose and is obtainable in a standard line of colors for water, gas, steam, oil, compressed air and other pipe lines.

MAINTENANCE ENGINEERING SERVICE.

CEMENT FLOOR
HARDENER.

MILL WHITE.

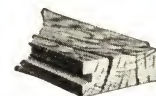
WOOD FLOOR
PRESERVATIVE.

BAR-OX
STEEL COATING.

STONETEX
MASONRY
COATING.

SKYLIGHT
AND WINDOW
CLEANER

TRUSCON PIPE
IDENTIFICATION
PAINT.





THE PEDLAR PEOPLE LIMITED

EXECUTIVE OFFICES: OSHAWA, CAN.

FACTORIES: OSHAWA AND MONTREAL

BRANCHES AT

MONTREAL,
26 Nazareth St.

OTTAWA,
Banque Nationale Bldg.

TORONTO,
473 College St.

HAMILTON,
Clyde Block,
King & Hughson Sts.

WINNIPEG,
80 Lombard St.

VANCOUVER
318 HOMER ST.

Sole Sales Agents in Canada for CLINTON ELECTRICALLY WELDED WIRE FABRIC, Manufactured by WICKWIRE SPENCER STEEL CORPORATION, Worcester, Mass., U.S.A., and Buffalo, N.Y., U.S.A.

CLINTON FABRIC REINFORCE- MENT.

THE MATERIAL.—Clinton Electrically Welded Wire Fabric is a wire mesh reinforcement fabricated from a special grade of steel wire having an ultimate tensile strength of from 60,000 to 85,000 lbs. per square inch.

USES.—The material is especially adapted for reinforcement in concrete floors, roofs, walls, sewers, reservoirs, levees, and all kinds of slab construction. It is also used to special advantage as a wrapping for steel in all kinds of work involving the covering or protection of steel with concrete.

THE IDEAL REINFORCING FOR SLAB CONSTRUCTION.

THE RECTANGULAR MESH.—There are no zigzag or diagonal members. When used in floor or roof slabs, the longitudinal wires resist the main tensile stresses, while the transverse wires, which act as spacers for the longitudinals, serve to distribute concentrated loads and to prevent cracking due to changes in temperature.

THE PERFECT BOND.—The transverse wires, which are securely and absolutely connected to the longitudinals, provide at each welded point an absolute mechanical bond and barrier against movement in the concrete.

THE ELECTRIC WELD.

THE ELECTRIC WELD.—Transverse and longitudinal wires are connected by an absolute and perfect cross-weld actually fused together.

UNBROKEN CONTINUITY.—In floor and roof slabs perfect continuity is obtained—no laps, no splices, no misplaced steel, but always the full value of the reinforcement, representing exactly what the plans call for.

EASE AND ACCURACY OF INSTALLATION.—It eliminates expense and uncertainty involved in the placing and wiring of loose rods. Great quantities can be laid in a very short time by the most unskilled labourer with absolute assurance that every reinforcing unit is in its proper position.

GALVANIZING.—Clinton Welded Wire Fabric is furnished either galvanized or with plain steel longitudinals.

CLINTON FABRIC FLOORS.

The various floor slabs of the type as shown by sketch and as herewith tabulated in the table have actually been tested in New York City and officially approved by the Bureau of Buildings for the live loads as given.

STOCK.

We carry in stock a large assortment of Clinton Fabrics, and can make immediate shipment at prices which will prove interesting.

INFORMATION.

For information, printed matter and prices, address home office of The Pedlar People Limited, or any of their various branches.

See also our advertisements, pages 47 and 66.

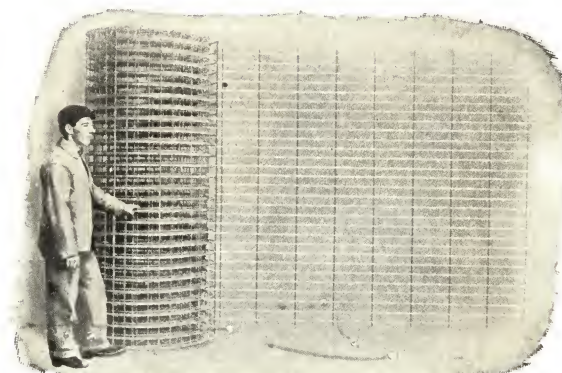


PHOTO OF ROLL OF CLINTON ELECTRICALLY WELDED WIRE FABRIC



THE CLINTON ELECTRIC WELD.

In this view the two wires have been cut through at their point of union, revealing a perfectly smooth surface. It is a perfect weld; the two wires are actually fused together.

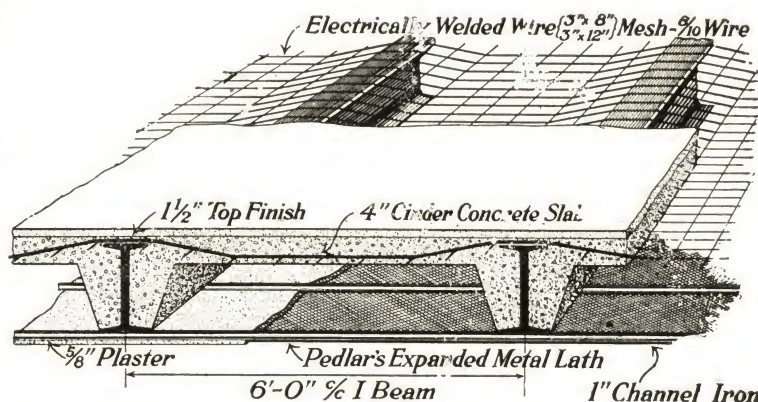


ILLUSTRATION SHOWS POSITION CLINTON FABRIC TAKES IN REINFORCING SLAB.

APPROVED CLINTON FLOOR SLABS.

Span C/C Beams.	Approved Live Load Lbs. per Sq. Ft.	Thickness of Slab.	Concrete.	Clinton Welded Wire Fabric Reinforcement. How Specified.
6' 0"	150	4"	1 : 2 : 5 Cinder	4" x 16 6/10"
6' 6"	300	4"	1 : 2 : 5 Cinder	3" x 16 3/8"
6' 6"	400	4"	1 : 2 : 5 Cinder	2" x 16 4/9"
7' 6"	200	4"	1 : 2 : 5 Cinder	2" x 16 6/10"
8' 0"	250	4"	1 : 2 : 5 Cinder	2" x 16 4/9"

For wide spans, two or four-way reinforcement should be used and should be designed by a competent engineer or on information secured from the Pedlar People, Limited.



THE PEDLAR PEOPLE LIMITED

EXECUTIVE OFFICES; OSHAWA, CAN.

FACTORIES: OSHAWA AND MONTREAL

ADDRESS NEAREST BRANCH.

MONTREAL,
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Clyde Block,
King & Hughson Sts.

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318 HOMER ST.



PEDLAR'S "RIB FABRIC" AFFORDS ECONOMICAL FIREPROOF CONSTRUCTION FOR ALL PURPOSES

Pedlar's "Rib Fabric" is cut and drawn from one sheet of steel into a series of five heavy cold-drawn ribs spaced at 4" centres, connected by a diamond-shaped mesh expanded metal, affording a perfect mechanical bond for concrete and a continuous reinforcement correctly located in the slab.

Pedlar's "Rib Fabric" supplied in either flat or curved sheets in all gauges.

For roofs and floors it makes a light, strong, fireproof construction, without forms or centering.

For ceilings it is a combination metal lath and furring, facilitating rapid erection and permanence.

For walls and partitions the rib does away with permanent studding, making a light, strong, thin wall that is sanitary and fireproof.

Pedlar's "Rib Fabric" for all kinds of high-grade construction, combines strength, safety and durability with economy.

Made in painted or galvanized stock.

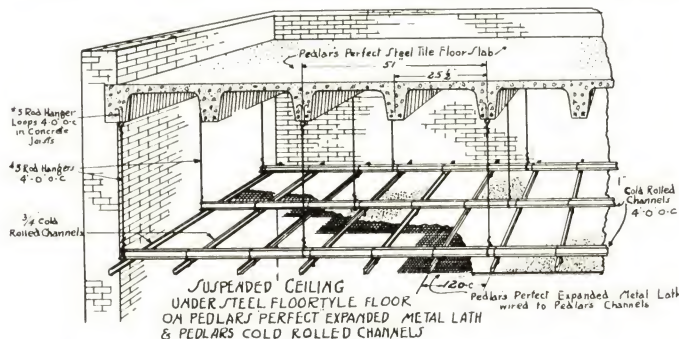
Send for complete Fireproofing Catalogue for full particulars.

Pedlar's Lo-rib Metal Lath is a material in which the best features of our Rib-fabric and Flat Lath are combined. It permits of a lighter type of construction and requires less plaster than our 5-rib Fabric. The longitudinal ribs give great strength to the sheets and do not require channel iron supports for either walls or ceilings. It is cold drawn and formed from one sheet of metal having six crimped ribs connected with the diamond-shaped mesh of Pedlar Expanded Metal Lath and forms a perfect bond with the plaster. The ribs are $\frac{1}{4}$ " high and are spaced at $4\frac{1}{2}$ " centres. Sheets are 22 inches wide by 96 inches long. Supplied in either painted or galvanized stock in gauges 24 and 26 only.

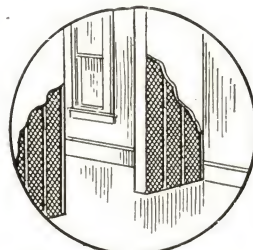
Pedlar's Perfect Steel Floortyle are light sheet metal forms of various depths used in reinforced concrete floor construction. These form a series of uniform regularly spaced joists or T beams in which is combined the necessary amount of reinforcement and concrete to support the desired load. They occupy from 45% to 60% of the cubical measure of the floor, thus eliminating the weight of useless concrete and concentrating the essential area of concrete and reinforcement in position to secure its maximum strength. This saving in material is accomplished without in any way sacrificing the strength of the floor but materially decreases the dead load of the floor-slab, permitting either a greater live load or the use of a lighter sub-structure.

Floortyle are made in depths of 4", 6", 8", 10", 12" and 14" in lengths of 30 and 36 inches.

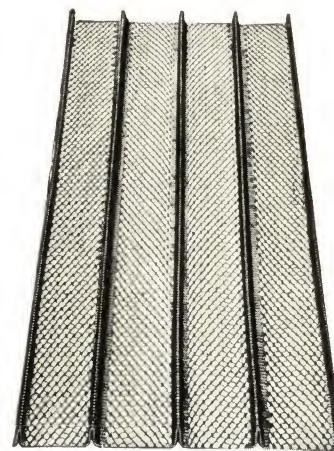
Taper tyle and end caps can be supplied in all sizes.



Suspended ceilings are readily formed by building anchors into the joists between the Tyle before the concrete is placed. See diagram above



'RIB FABRIC' PARTITION.



Ribs 15/16 in. high, 4 inches apart. Sheets, 16 in. wide. Standard lengths, 6, 8 and 10 feet. Gauges, 22, 24, 26 and 28.

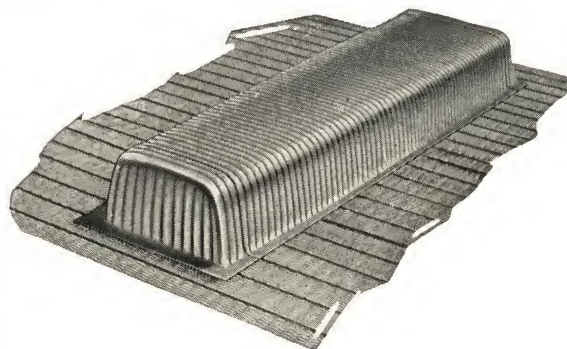


Illustration showing Floortyle used with Pedlar's "Perfect" Low Rib Metal Lath.

PEDLAR'S
"RIB FABRIC"
FOR REINFORCING
ROOFS, CEILINGS,
FLOORS,
PARTITIONS,
COLUMNS, Etc.

PEDLAR'S
LO-RIB
METAL
LATH.

PEDLAR'S
PERFECT
STEEL
FLOORTYLE.



THE PEDLAR PEOPLE LIMITED

EXECUTIVE OFFICES: OSHAWA, CAN.

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80 Lombard St

VANCOUVER,
318 Homer St.



HAS THE FOLLOWING DISTINCTIVE ADVANTAGES:

Great unit strength combined with a high elastic limit.

A uniformity of quality and stiffness which makes a reinforcing so taut that it requires no stretching or placing to eliminate "waves."

Because of its sheet form it is handled with great ease, thus permitting greater use of unskilled labor with a resultant saving in cost.

"Steelcrete" is made in an extensive range of sizes by the cold drawn process. Special machinery first slots the steel sheet and then expands it into a diamond-shaped mesh.

Expressed in pounds, the weights run from 200 pounds per 100 square feet to 14 pounds per 100 square feet.

The approximate size of the strands vary from $5/64 \times 3/32$ inches to $13/64 \times 23/64$ inches. In these dimensions the first fractional figure represents the thickness of the gauge, while the second fractional figure represents the thickness of the strand.

Figuring on the short way of the mesh across the sheet, the widths of the sheets vary from 4 feet 8 inches to 8 feet. Eight feet is the arbitrary maximum made necessary by the limitation of floor space in railroad cars.

In length sheets run from 8 to 16 feet.

MADE IN CANADA.

EXPANDED
METAL
REINFORCING.

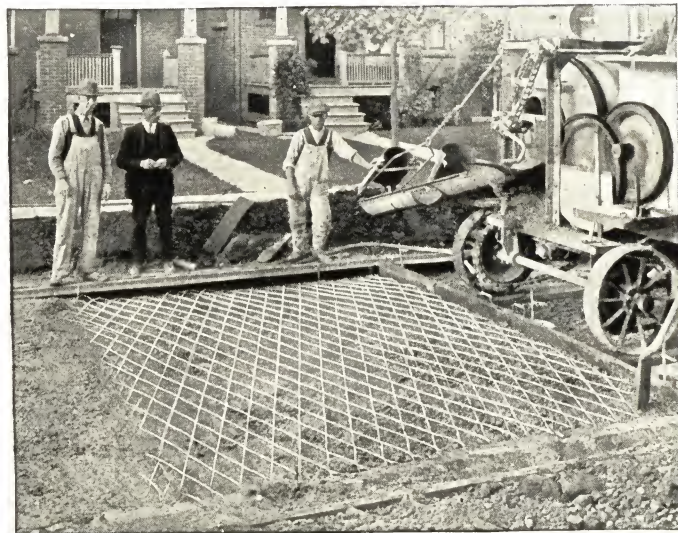
PEDLAR'S "PERFECT" STEELCRETE

DIMENSION TABLE

STYLE NUMBER	HEIGHT IN FEET	APPROX. WEIGHT PER SQ. FT.	SIZE OF STRANDS IN INCHES	SECTIONAL AREA PER FOOT OF MESH	SIZE OF SHEETS SHORT WAY OF MESH	LONG WAY OF MESH
6-12-04	0.14	24	$5/64 \times 3/32$	0.4	7'-6"	16'
6-12-07	0.25	42	$5/64 \times 1/16$	0.7	7'-6"	-
6-12-08	0.27	48	$5/64 \times 1/8$	0.8	6'-9"	-
3-14-06	0.20	36	$3/64 \times 1/16$	0.6	6'-2"	8'-6"
3-14-08	0.27	48	$3/64 \times 1/8$	0.8	7'-0"	-
3-14-10	0.34	60	$3/64 \times 1/4$	1.0	5'-6"	-
3-12-11	0.37	66	$3/64 \times 1/2$	1.1	7'-0"	8'-6"
3-12-125	0.41	72	$3/64 \times 1/2$	1.25	6'-3"	-
3-12-135	0.46	78	$3/64 \times 1/2$	1.35	5'-9"	-
3-10-15	0.51	84	$3/64 \times 1/2$	1.5	6'-3"	-
3-10-20	0.68	112	$3/64 \times 1/2$	2.0	4'-9"	-
3-10-25	0.85	140	$3/64 \times 1/2$	2.5	7'-6"	-
3-10-30	1.02	168	$3/64 \times 1/2$	3.0	6'-9"	-
3-10-35	1.19	196	$3/64 \times 1/2$	3.5	5'-9"	-
3-6-40	1.38	224	$3/64 \times 1/2$	4.0	7'-0"	-
3-6-45	1.53	246	$3/64 \times 1/2$	4.5	6'-3"	-
3-6-50	1.70	270	$3/64 \times 1/2$	5.0	5'-9"	-
3-6-55	1.87	294	$3/64 \times 1/2$	5.5	5'-3"	-
3-6-60	2.00	312	$3/64 \times 1/2$	6.0	4'-9"	-
SPECIAL MESHES						
1-14-20	0.68	112	$1/16 \times 1/8$	2.0	5'-3"	0
1-14-25	0.85	140	$1/16 \times 1/8$	2.5	4'-3"	-
5-16-20	0.68	112	$3/64 \times 1/8$	2.0	7'-6"	-

T16 220407/5

GENERAL
SHEET METAL
WORK.



Road Mesh, 6" mesh, No. 10 gauge, section .07, weight 25 lbs. per 100 sq. ft. Being laid on Castlefield Ave., Toronto.



Laying Steelcrete on New Hamilton Bridge, 3" mesh, No. 10 gauge, weight 1.19 lbs. per sq. ft. and 3" mesh, No. 10 gauge weight .68 lbs. per sq. ft. Sheets for curb broken to suit at factory.

Pedlar's Sheet Metal Building Materials include Metal Shingles, Sidings, Roofings, Metal Ceilings, Metal Tiles, Stamped Ornamental Zinc and Copper Work, Eavetrough and Conductor Pipe, Portable Buildings, Garages, Piping "Saino" All Metal Fire Doors, Metal Culverts etc. Made

for Ventilating and Heating Installations, from any desired material.

GET OUR GENERAL CATALOGUE No. 25R.

See also our advertisements on pages 47 and 66.

UNITED STATES STEEL PRODUCTS COMPANY

EXPORTERS OF THE PRODUCTS OF

CARNEGIE STEEL CO.	AMERICAN STEEL & WIRE CO.	AMERICAN BRIDGE CO.	NATIONAL TUBE CO.
ILLINOIS STEEL CO.	AMERICAN SHEET & TIN PLATE CO.	THE LORAIN STEEL CO.	SHELBY STEEL TUBE CO.
TENNESSEE COAL, IRON & RAILROAD CO.		MINNESOTA STEEL CO.	

GENERAL OFFICES: NEW YORK.

CANADIAN SALES OFFICES:

NEW GLASGOW.	MONTREAL.	TORONTO.	WINNIPEG.	VANCOUVER.
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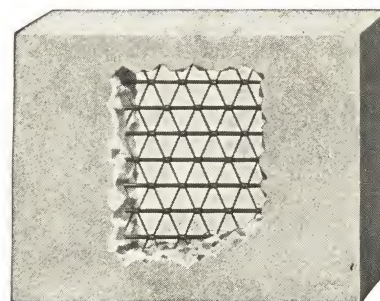
"TRIANGLE MESH."

A woven wire fabric with single or stranded longitudinal members spaced by means of diagonal cross wires.

Made from cold drawn high tensile wire. The Ideal Reinforcement for all concrete work. Carried in stock at several Canadian points.

Special Booklet on request.

May be had in black or galvanized and of areas to suit all requirements.



"KEYSTONE" COPPER BEARING STEEL SHEETS.



Copper Bearing Steel Sheets, black or galvanized. The universally recognized product of quality, proved by time and service. "KEYSTONE" is worth more when resistance to rust is the influencing factor.

"APPOLLO" galvanized and "SPECIAL."

"ARROW" black and "U.S. ELECTRICAL."

GENERAL PRODUCTS.

Beams, Channels, Angles, Tees, Plates, Bars, Hoops and Bands. Axles, Steel Wheels and Circular Sections. Steel Sheet Piling. Pipe of all kinds, Boiler Tubes, Poles, Cylinders, Seamless Tubes. Rails for Steam and Tram Roads. Track Accessories, Railroad and Industrial Steel Ties. Special Track Work, Frogs, Crossings, Switches and Stands. Aerial Tramways, Bleichert System. Locked Coil Track Cable. Locked Wire Cable and Smooth Coil Track Cable for Aerial Tramways. Iron and Steel Wire Rope, Bright and Galvanized. Sash Cord and Clothes Lines. Copper Wire and Cable. Copper Rail Bonds, Solid and Stranded. Weather Proof Insulated Telephone and Signal Wire. Galvanized Telegraph and Telephone Wire. Round and Flat Wire Steel Springs.



TRUSSED CONCRETE STEEL COMPANY

OF CANADA, LIMITED

WALKERVILLE, ONTARIO

MONTREAL

TORONTO

WINNIPEG

CALGARY

VANCOUVER

WAREHOUSES AT

TORONTO

WINNIPEG

CALGARY

MONTREAL

Truscon
BUILDING
PRODUCTS

For modern permanent construction cover Reinforced Concrete in all its phases; Steel Window Sash of every type; Metal Lath for Plaster and Stucco; Concrete Highway Reinforcement, etc.



Truscon TRUSSED BAR

With rigidly attached Shear members. Ideal for Beams and Girders.

Furnished in 5 sections, viz.:-

$\frac{1}{2}$ " x $1\frac{1}{2}$ "	$\frac{3}{4}$ " x $2\frac{3}{16}$ "	$1\frac{1}{2}$ " x $2\frac{1}{4}$ "	$1\frac{3}{4}$ " x $2\frac{3}{4}$ "	2 " x $3\frac{1}{2}$ "
Sec. Area . . 0.41 in.	0.79 in.	1.41 in.	2.00 in.	3.00 in.

Furnished in 8 sizes, varying by $\frac{1}{8}$ in. from $\frac{3}{8}$ in. to $1\frac{1}{4}$ in. The sectional area is the same as the square for the same dimensions.



TRUSSED BAR.

Truscon RIB BARS.



RIB BAR.

Truscon RIB METAL.

Rib Metal consists of a series of nine straight bars or ribs rigidly connected by cross members formed from the same sheet of steel. These cross members accurately space and thoroughly anchor the main bars in the concrete, providing a perfect reinforcement against temperature and shrinkage strains. The ribs span in the direct line of the greatest strain and are stiff and rigid, assuring their accurate location in the concrete.

Rib Metal is furnished in flat sheets for floors, roofs, walls, vaults, etc., or bent to exact curve of arches, conduits, sewers, reservoirs, tanks, etc.

Area of one Rib = .075 sq. in. Furnished in 7 sizes varying by 1" from 2" to 8". All lengths up to 18 feet.

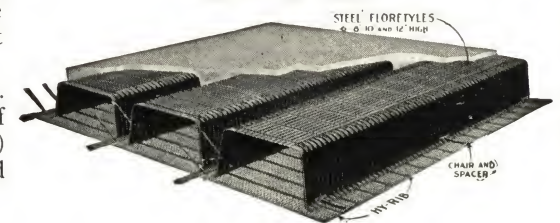
Steel Floretyle Construction is the most advanced type of Reinforced Concrete Floor Construction, and is particularly adapted for Apartments, Office and Public Buildings. It consists of rows of specially formed steel Floretyles separated by Reinforced Concrete Joists and covered with a thin layer of concrete. The deep narrow joists carry the loads directly to the supports while the Floretyles act merely as a filler, eliminating the dead weight of large masses of concrete and producing a light floor of great rigidity.

Standard Heights: 6 in., 8 in., 10 in., and 12 in. Approximate Width at Base: $20\frac{1}{2}$ in., exclusive of flanges along bottom edges. Standard Lengths (nominal) of all sizes, 4 ft. and 3 ft. Actual Lengths are 4 ft. 1 in. and 3 ft. 1 in. to provide for end lap.

Hy-Rib is a steel mesh, stiffened by rigid ribs, all manufactured from a single plate of steel. The mesh of Hy-Rib provides a perfect key for the plaster, and a rigid surface to work against. In concrete floors and roofs Hy-Rib provides thorough reinforcement and eliminates forms. In sidings, partitions and ceilings Hy-Rib permits wide spacing of supports, saving in channels and wiring. For arches and tanks Hy-Rib is furnished curved by our factory.



TRUSCON RIB METAL.



STEEL FLORETYLE.

PROPERTIES OF HY-RIB.

Type of Hy-Rib.	Gauge Nos.	Height of Ribs	Spacing of Ribs	Width of Sheets.
$\frac{1}{8}$ " Hy-Rib.	24 26 28	$\frac{1}{2}$ "	4"	28"
$\frac{3}{8}$ " Hy-Rib.	24 26 28	$\frac{3}{8}$ "	4"	24"

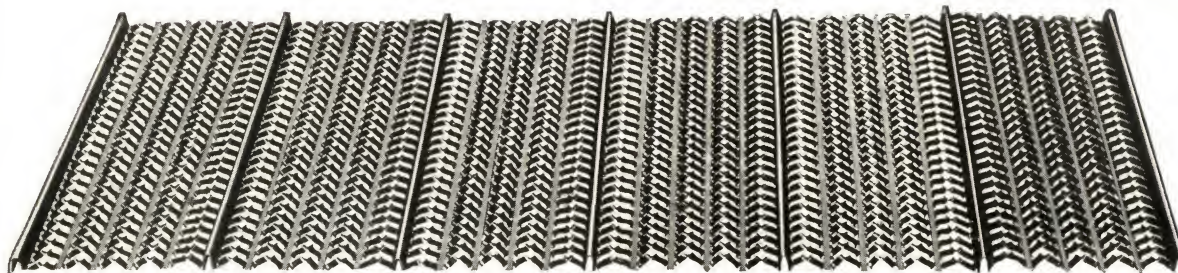
Other lengths are cut from standard lengths without charge except for waste.

All necessary side laps are provided in the Hy-Rib. Allow 2" for end laps where splice occurs over supports; otherwise, 8".

$\frac{1}{8}$ " Hy-Rib is shipped in bundles of 4 sheets; $\frac{3}{8}$ " Hy-Rib in bundles of 10 sheets.

Hy-Rib is supplied either painted or unpainted; in Open Hearth or Copper Bearing Steel.

$\frac{1}{8}$ " Hy-Rib is furnished curved to any radius greater than 13" in any segment less than one-third circle.



$\frac{1}{8}$ IN. HY-RIB. RIBS $\frac{1}{8}$ IN. HIGH, 4 IN. APART; SHEETS 28 IN. WIDE. GAUGE 24, 26 OR 28—STANDARD LENGTHS, 8, 10 AND 12 FEET.

See also our advertisement on Steel Sash, page 237

TRUSSED CONCRETE STEEL COMPANY

OF CANADA, LIMITED

WALKERVILLE, ONTARIO

MONTREAL

TORONTO

WINNIPEG

CALGARY

VANCOUVER

TORONTO

WINNIPEG

CALGARY

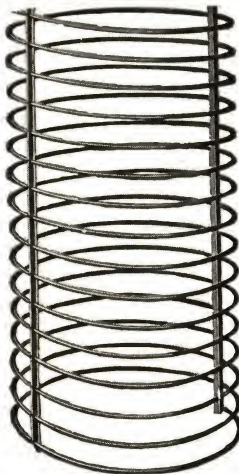
MONTREAL



Truscon
BUILDING
PRODUCTS

For modern permanent construction cover Reinforced Concrete in all its phases; Steel Window Sash of every type; Metal Lath for Plaster and Stucco; Concrete Highway Reinforcement; Spot Grounds; etc.

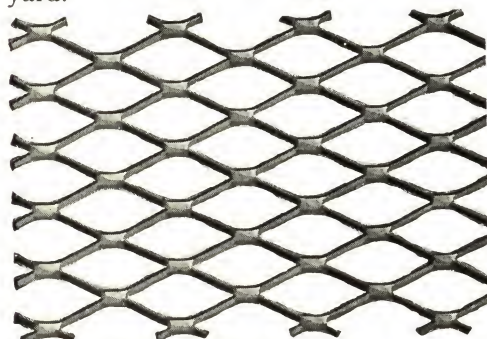
Truscon COLUMN HOOPING



SET UP.

amount of plaster. Lorib is a very economical lath, as it permits of wider spacing of studs and effects a great saving in labour and materials. Permits two coat work instead of three.

Sheets, 18" x 96". Weight, 3.2 lbs. per square yard.



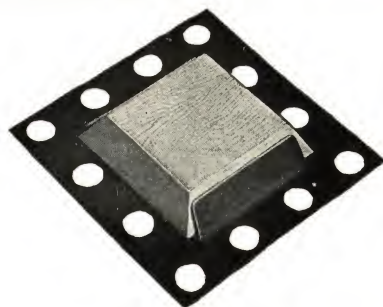
TRUSCON DIAMOND MESH LATH.

Truscon DIAMOND MESH LATH.

Truscon NATIONAL INSERTS.

Truscon National Inserts are used in concrete slabs, beams and columns for attaching shafts, hangers, sprinkler systems, etc., and are incorporated into the concrete while under construction by securely nailing them to the wood forms, doing away with extensive drilling into the concrete after the building is complete.

They are made of iron in three sizes, properly cored and tapped to receive $\frac{1}{2}$ ", $\frac{5}{8}$ " and $\frac{3}{4}$ " bolts.



WALL SPOT GROUND.

Truscon SPOT GROUNDS.

Truscon SLOTTED INSERTS.

Truscon Slotted Inserts are used where a greater degree of adjustability is desired than can be obtained by the use of Truscon Adjustable Inserts. Only the narrow slot flush with the concrete is seen in the completed work. The bolt can be moved along this slot to any desired location, allowing a wide variation in position. Standard lengths, 18", 24", 36" and 60". A continuous Insert of any desired length can be obtained by removing the end caps and butting the Inserts end to end.

Also see our advertisements on Steel Sash, page 237.

COLLAPSIBLE COLUMN HOOPING.

Collapsible Column Hooping, for reinforcing concrete columns, is shipped in the form of flat, circular coils of exact diameter and accurately spaced by means of special spacing bars. These coils spring automatically into a complete hooped column on cutting the small fastening wires.

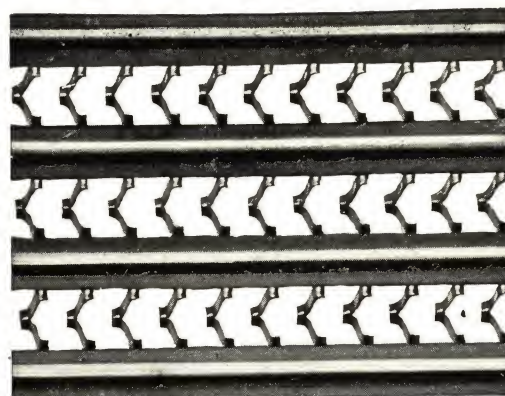
Rib Bars are ordinarily used as vertical reinforcement in conjunction with Column Hooping.

SIZES OF COLLAPSIBLE COLUMN HOOPING.

Shipped complete with two or three spacing bars.

Sizes of wire for hooping: $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{7}{16}$ " and $\frac{1}{2}$ " diameter.

Diameter of Coils: 9" to 30". Pitch: $1\frac{1}{2}$ " to 12".



TRUSCON LORIB.

Truscon Diamond Mesh Lath is a perfect metal lath and is furnished in sheets 24 inches wide and 8 feet 1 inch long. This extra 1 inch allows for lap of sheets.

Gauges, 24 and 26.

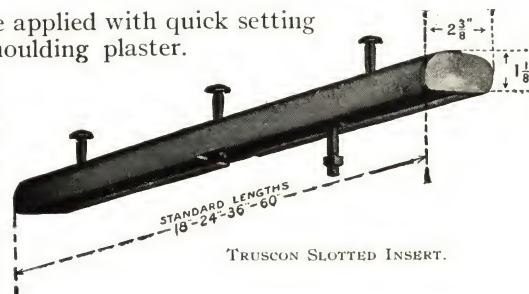
Painted or galvanized.



SOCKET INSERTS.

A Spot Ground is a nailing block of wood held in a metal plate and is used for attaching wood or metal trim to walls, screeds or metal slabs, securing plumbing, electrical fixtures, etc. On floors, they eliminate the necessity of using cinder fill.

Spot Grounds are applied with quick setting plaster of paris or moulding plaster.



TRUSCON SLOTTED INSERT.

BURLINGTON STEEL COMPANY, LIMITED

MANUFACTURERS OF

STEEL BARS, ROUNDS, SQUARES, FLATS, ANGLES, CHANNELS, AGRICULTURAL SHAPES, SPECIAL SECTIONS,
TWISTED SQUARES FOR REINFORCING CONCRETE
HAMILTON, CANADA

PRODUCTS.

RAIL-CARBON BARS.

THE BURLINGTON STEEL COMPANY, LIMITED are the sole manufacturers in Canada of the RAIL-CARBON STEEL BAR for reinforced concrete work.

RAIL-CARBON BARS are manufactured from railroad rail by continuing the rolling process as indicated in the diagram until the required section is obtained.

In the manufacture of RAIL-CARBON BARS absolutely nothing but railroad rails are used, purchased under a rigid specification.

In the manufacture of rails only the finest of steel is used, the ingot being cropped to a clean fracture thus eliminating all the dirt, piping and segregation. The balance which goes into the rail is the purest of steel, and this again is subjected to the most critical chemical and physical tests before the rail is finally passed as fit for the severe service of the road-bed.

It follows that RAIL-CARBON BARS ARE COMPOSED OF THE PUREST OF STEEL.

RAIL-CARBON BARS have an Elastic Limit,—which is the limiting factor in design—averaging around 65,000 lbs. per square inch. The minimum set by standard specifications is 50,000 lbs.

RAIL-CARBON BARS will, therefore, do more work than any other bar, consequently one can cut down the tonnage, cut down the concrete, cut down the weight and finally the cost.

RAIL-CARBON BARS are higher in carbon than structural grade and are, therefore, harder; but numerous tests to destruction carried out by eminent engineering authorities have all failed to fracture these bars once they were embedded in the concrete. The concrete itself invariably shattered without affecting the rods.

THE BURLINGTON STEEL COMPANY LIMITED prides itself on fast and accurate service. We prefer to ship the bars cut to length, bent and tagged all ready to drop into the forms. Our plant in Hamilton is at the service of every Architect and Engineer in Canada. We are shipping today from Coast to Coast.

SPECIFICATIONS.

SPECIFICATIONS.

After a most thorough investigation lasting over one half of the year 1913, the American Society for Testing Materials drafted a Standard Specification for Rail-Steel Concrete Reinforcing Bars, designated as A16-14, copy of which is summarized below.

The Association of American Steel Manufacturers in 1912 also adopted a Standard Specification, the essential requirements of which are exactly the same as the first mentioned.

The Engineer or Architect requiring RAIL-CARBON BARS, therefore, need only add to his Specification:

"The reinforcement shall conform in all respects to the requirements of the A.S.T.M. Specification, A 16-14."

or

"The reinforcement shall conform in all respects to the requirements of the Manufacturers Standard Specification for Rail-Steel Bars."

AMERICAN SOCIETY FOR TESTING MATERIALS

PHILADELPHIA, PA., U.S.A.

Affiliated with the

INTERNATIONAL ASSOCIATION FOR TESTING MATERIALS
STANDARD SPECIFICATIONS

for

RAIL-STEEL CONCRETE REINFORCEMENT BARS

SERIAL DESIGNATION: A 16-14.

The specifications for this material are issued under the fixed designation A 16; the final number indicates the year of original issue, or in the case of revision, the year of last revision.

Adopted, 1913; Revised, 1914.

CLASSES.

1. These specifications cover three classes of rail-steel concrete reinforcement bar, namely: plain, deformed and hot-twisted.

I. MANUFACTURE.

2. The bars shall be rolled from standard section Tee rails.

3. Hot-twisted bars shall have one complete twist in a length not over 12 times the thickness of the bar.

II. PHYSICAL PROPERTIES AND TESTS.

4. (a) The bars shall conform to the following minimum requirements as to tensile properties.

PROPERTIES CONSIDERED.	PLAIN BARS	DEFORMED AND HOT TWISTED BARS
Tensile strength, lb. per sq. in.	80,000	80,000
Yield point, lb. per sq. in.	50,000	50,000
Elongation in 8 in., per cent.	1,200,000	1,000,000
	Tens. str.	Tens. str.

BEND TESTS.

6. The test specimen shall bend cold around a pin without cracking on the outside of the bent portion as follows:

THICKNESS OR DIAMETER OF BARS	PLAIN BARS	DEFORMED AND HOT-TWISTED BARS.
Under $\frac{3}{4}$ in.	180 deg. d = 3 t	180 deg. d = 4 t
$\frac{3}{4}$ in. or over.	90 deg. d = 3 t.	90 deg. d = 4 t.

Explanatory Note: d = the diameter of pin about which the specimen is bent.
t = the thickness or diameter of specimen.

TEST SPECIMENS.

7. (a) Tension and bend test specimens for plain and deformed bars shall be taken from the finished bars, and shall be of the full thickness or diameter of bars as rolled; except that the specimens for deformed bars may be machined for a length of at least 9 in. if deemed necessary by the manufacturer to obtain uniform cross-section.

(b) Tension and bend test specimens for hot-twisted bars shall be taken from the finished bars, without further treatment.

8. (a) One tension and one bend test shall be made from each lot of ten tons or less of each size of bar rolled from rails varying not more than 10 lb. per yard. in nominal weight.

(b) If any test specimen shows defective machining or develops flaws, it may be discarded and another specimen substituted.

(c) If the percentage in Section 4 (a) and any part of the fracture is outside the middle third of the gauge length, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

NUMBER OF TESTS.

BURLINGTON STEEL COMPANY, LIMITED

MANUFACTURERS OF

STEEL BARS, ROUNDS, SQUARES, FLATS, ANGLES, CHANNELS, AGRICULTURAL SHAPES, SPECIAL SECTIONS,

TWISTED SQUARES FOR REINFORCING CONCRETE

HAMILTON, CANADA.

THE PROCESS.

The ingot as it comes from the furnace.



The dirt, the excess alloys, and the gasses all gather to the top.

The Discard, representing in rail manufacture 30% of the whole, and containing all the foreign elements is cut off,



And the portion used in rail manufacture is all pure steel—no piping, no segregation.

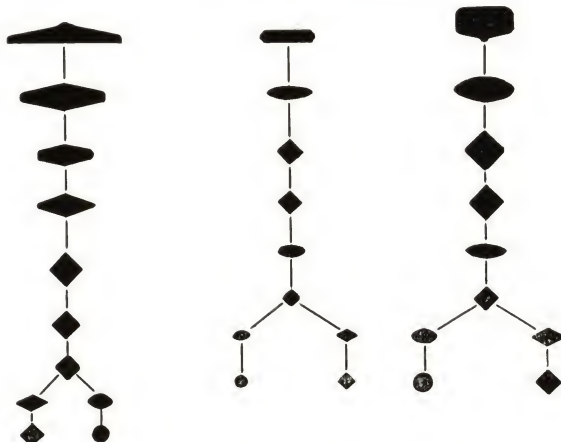
The bloom rolled from the ingot and the rail rolled from the bloom.



We purchase rails which have become worn in service, and occasionally secure new rails which are not suitable for track work on account of some surface defects. We break these rails into suitable lengths and subject them to a long slow soaking heat in a continuous furnace which entirely removes any internal stresses which might have been occasioned by their service on the road. The rails are then discharged from the furnace and passed through splitter rolls where they are split in to three separate billets, head, web and flange,—thus:—



These three different sections, or billets, are rolled separately and reduced to the required sizes of Steel Bars,—thus:—



We continue the rolling process commenced when the rail was new, and the product is the strongest bar of the purest steel on the market.

SPECIFY RAIL-CARBON BARS.

THE DON VALLEY BRICK WORKS

MONTREAL AGENT:
DAVID MCGILL,
320 LAGAUCHETIERE STREET.

HEAD OFFICE, DOMINION BANK BUILDING,
TORONTO, ONT.

WORKS:
DON VALLEY, TORONTO.

PRODUCTS.

We manufacture the "DON VALLEY" POROUS TERRA COTTA FIRE-PROOFING for Floors, Roofs, Ceilings, Partitions, Wall Furring, Column and Girder Coverings. Our extensive clay beds are suitable in quality and our facilities are unequalled for producing a high-grade Hollow Tile.

FLAT ARCHES.



Perspective of Typical Arch.

SIDE CONSTRUCTION.

This, the oldest method, has the advantage of the blocks being set so as to break joints, and the flat sides of the blocks give ample surface for making good mortar joints between them.

SEGMENTAL ARCHES.

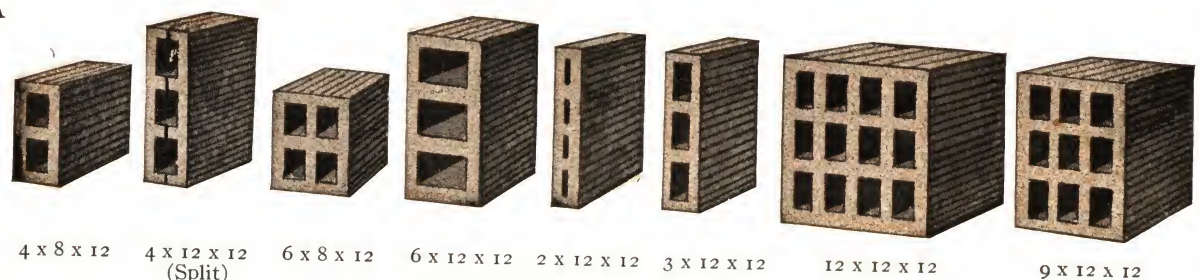


Section Showing Style of Skewbacks and Keys.

This form of arch combines great strength with lightness and cheapness. It is suitable for Warehouse Lofts, Factories, Sidewalks, or wherever a flat ceiling is not essential.

Weight of 6" Hollow Tile Arch, 27 pounds per square foot.

TERRA COTTA FOR WALLS AND PARTITIONS.



4 x 8 x 12

4 x 12 x 12
(Split)

6 x 8 x 12

6 x 12 x 12

2 x 12 x 12

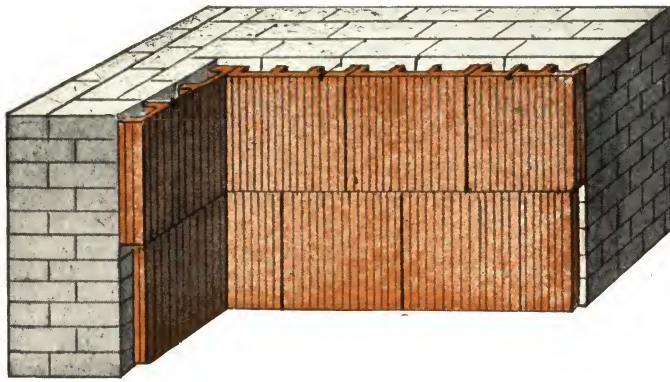
3 x 12 x 12

12 x 12 x 12

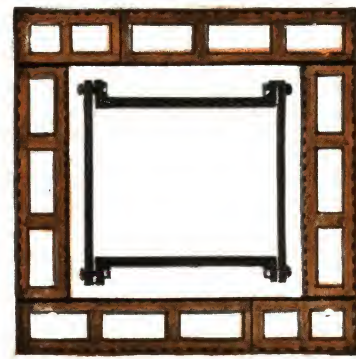
9 x 12 x 12

The above cuts represent shapes and sizes of our Porous Terra Cotta for Walls and Partitions.

WALL FURRING.



$1\frac{1}{2}$ x 12 x 12, weight per square foot, 8 pounds.
2 x 12 x 12, weight per square foot, 9 pounds.



Type of Column Covering.

Walls are furred to prevent the admission of moisture either by lining the inside with Terra Cotta Furring Blocks, or by building the inside face of the wall with hollow bricks.

The former method is the more effective and takes less room. We carry large stocks of each.

COLUMN COVERINGS.



Perspective of Column Fireproofing.



Type of Column Covering.

Steel and cast-iron columns must be covered with at least two inches of Porous Terra Cotta. We manufacture and carry in stock a variety of column coverings.

TOUGHER AND WELL-BURNED. Our Terra Cotta is tougher than other makes, thoroughly burned, and is stronger and better for the fireproofing of columns and girders and has less waste than other makes.

PROMPT DELIVERY. We guarantee prompt delivery, furnishing at the same time goods of the very highest quality.

See also our advertisement on pages 4 and 5.

NATIONAL FIRE PROOFING COMPANY OF CANADA, LIMITED

HEAD OFFICE: DOMINION BANK BUILDING,
TORONTO, ONTARIO.

FACTORY: HAMILTON.

PRODUCTS.

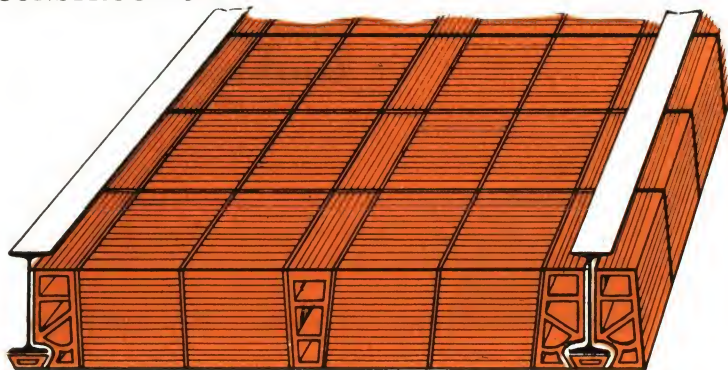
Manufacturers of DENSE, SEMI-POROUS and POROUS HOLLOW TILE for FIREPROOF FLOORS, ROOFS, CEILINGS, PARTITIONS, WALL FURRING, COLUMN and GIRDER COVERINGS and EXTERIOR WALLS. Contractors for FIREPROOF CONSTRUCTION in both HOLLOW TILE and REINFORCED CONCRETE.

ADVANTAGES.

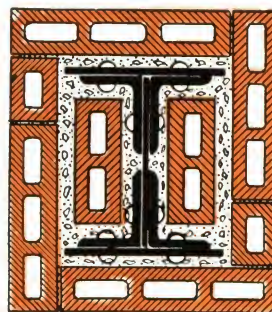
Our factory is the largest in the Dominion of Canada devoted exclusively to the manufacture of Structural Terra Cotta. Our stock sizes embrace some 400 shapes, and we are equipped to manufacture material for special usages at short notice.

NATCO FLAT ARCH CONSTRUCTION.

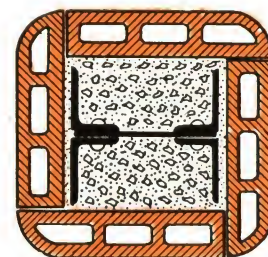
The Flat Arch is the accepted type of Standard Fireproof Floor Construction, meeting every requirement as to strength, fire protection, architectural appearance and minimum weight.



Perspective of Typical Arch.



DETAILS OF TYPICAL
NATCO COLUMN
COVERING.



LOAD TABLE FOR FLAT ARCH CONSTRUCTION.

SAFE LOADS (Weight of Arch Deducted) POUNDS PER SQUARE FOOT.

The weight of the arch has been deducted from safe loads in table below, so that only the dead load of concrete fill, plastering, etc., must be deducted to obtain the net safe live load for any arch and span.

Arches	6 Inches	7 Inches	8 Inches	9 Inches	10 Inches	12 Inches	15 Inches
Spans, Feet and Inches	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
3-0	458	588	735	901	1084	1487	2210
3-3	386	496	622	763	916	1262	1877
3-6	330	424	531	653	785	1083	1612
3-9	284	365	459	565	679	938	1398
4-0	247	318	399	493	593	820	1223
4-3	216	278	350	433	521	722	1079
4-6	190	245	309	382	461	640	951
4-9	168	217	274	340	410	571	855
5-0	149	193	244	304	367	511	767
5-3	...	172	218	272	330	460	691
5-6	...	154	196	245	297	416	626
5-9	...	139	176	222	269	378	569
6-0	...	...	159	201	244	344	518
6-3	...	...	144	183	222	314	474
6-6	...	...	131	166	203	287	435
6-9	...	...	...	152	186	264	400
7-0	...	...	...	139	170	243	369
7-6	...	...	...	...	144	206	315
8-0	...	...	...	...	...	177	272
8-6	...	...	...	...	...	153	236
9-0	...	...	...	...	...	132	205
Weight of Arch, Sq. ft.	26	33	36	38	40	46	56

Stock Sizes—2" to 12" in Thickness.

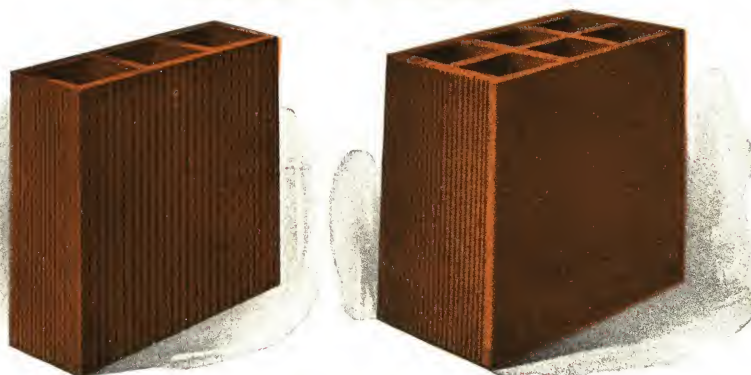
NATCO HOLLOW TILE PARTITIONS.

Fireproof, soundproof, easily erected, and the standard for stability, especially where called on to support plumbing fixtures, heavy picture frames, shelving, etc.

Hollow tile partitions are commonly built of dense material: 3-in. tile can be used safely to a height of 12 ft.; 4-in. to 16 ft.; 5-in. to 20 ft.; and 6-in. to 24 ft.

NATCO CATALOGUES.

Covering various uses of Natco Tile will be furnished on request.



4-in. Partition Block. Average Weight 17 lbs. 8-in. Partition Block, 4-Cell. Average Weight 30 lbs.
6-in. Partition Block. Average Weight 22 lbs. 10-in. Partition Block, 6-Cell. Average Weight 36 lbs.

CONTINUED ON NEXT PAGE

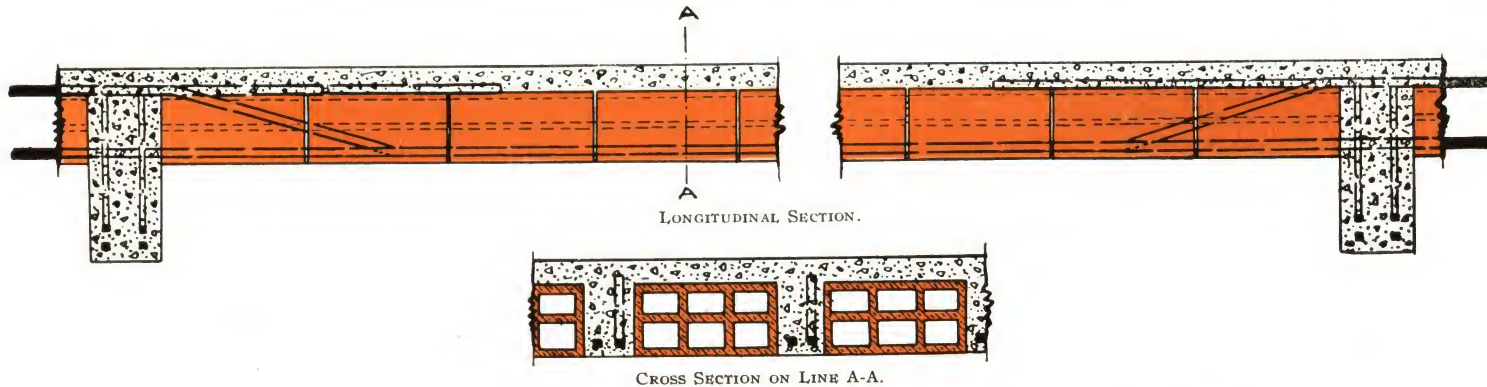
**NATCO
COMBINATION
HOLLOW TILE
AND REIN-
FORCED CON-
CRETE FLOOR
CONSTRUCTION.**

This floor has been used successfully and to economical advantage in many large modern buildings. As shown by the detailed drawing, the centering for this floor is very simple, a solid centering not being necessary. This, of course, is a great factor in reducing the cost of construction.

It will be seen that the tile is first laid on the centering, and after the courses of tile are in place the reinforced concrete joists are cast between the tile courses.

The courses of tile act in compression together with the reinforced concrete rib and also act as a side centering to hold the concrete in place until it has set.

If an additional top coating of concrete is necessary to give the floor requisite strength to carry the load for which it is designed, this top coat is then spread over the entire floor surface to the depth required.



**DETAIL OF TYPICAL LONG SPAN COMBINATION HOLLOW TILE AND REINFORCED CONCRETE FLOOR
CARRIED ON REINFORCED CONCRETE BEAMS.**

**LOAD TABLE
FOR COMBINA-
TION FLOOR
SLAB WITH 2"
CONCRETE TOP.**

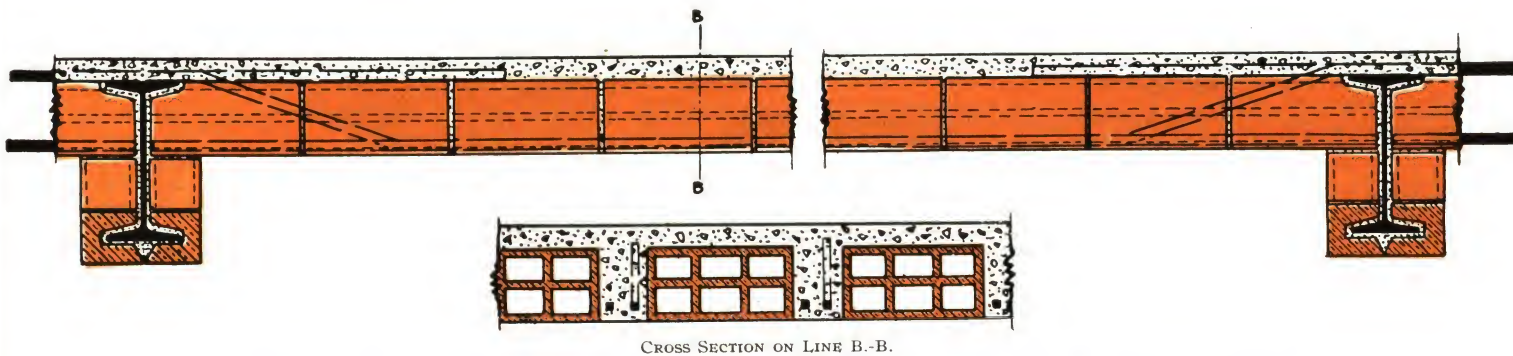
TOTAL SAFE LOADS (DEAD AND LIVE) POUNDS PER SQUARE FOOT.
The figures on left in tables denote the depth of tile in inches, the figures on right the area of reinforcing steel in each concrete joist in square inches.
fc. 650 lbs. per sq. in. $\frac{E_c}{E_s} = \frac{1}{15}$ $\frac{3}{4}$ -in. of concrete below reinforcement.
fs. 16,000 lbs. per sq. in. 4-in. concrete joists 16 in. o. c.

Total Load	W L												
		150	165	180	195	210	225	240	260	300	335	375	450
Continuous span	12												
Continuous span	10	125	135	150	160	175	185	200	220	250	280	310	375
Semi-continuous span	9	110	120	135	145	155	170	180	195	225	250	280	335
Simple span	8	100	110	120	130	140	150	160	175	200	225	250	300
Span, ft.	6						3/.19	3/.20	3/.22	3/.26	3/.29	3/.32	3/.39
Span, ft.	7		3/.19	3/.21	3/.23	3/.24	3/.26	3/.28	3/.32	3/.35	3/.38	3/.44	4/.42
Span, ft.	8	3/.23	3/.25	3/.27	3/.30	3/.32	3/.34	3/.37	3/.40	3/.46	4/.41	4/.46	4/.55
Span, ft.	9	3/.29	3/.32	3/.35	3/.37	3/.39	3/.41	3/.43	3/.46	4/.46	4/.52	4/.58	5/.57
Span, ft.	10	3/.36	3/.39	3/.43	3/.46	4/.40	4/.43	4/.46	4/.50	4/.57	5/.53	5/.59	5/.71
Span, ft.	11	3/.43	3/.47	4/.42	4/.45	4/.48	4/.52	4/.55	4/.61	5/.57	5/.64	5/.72	6/.73
Span, ft.	12	4/.41	4/.45	4/.49	4/.53	4/.58	5/.51	5/.55	5/.60	5/.68	6/.65	6/.72	7/.78
Span, ft.	13	4/.48	4/.53	4/.58	5/.52	5/.56	5/.60	5/.64	5/.70	6/.68	6/.77	7/.76	8/.80
Span, ft.	14	4/.56	5/.51	5/.56	5/.60	5/.65	5/.69	6/.63	6/.69	6/.79	7/.79	8/.78	9/.85
Span, ft.	15	5/.53	5/.58	5/.64	5/.69	6/.63	6/.68	6/.72	6/.79	7/.81	8/.81	8/.89	10/.88
Span, ft.	16	5/.60	5/.68	5/.72	6/.67	6/.72	6/.77	7/.74	7/.81	8/.81	9/.84	9/.93	12/.83
Span, ft.	17	5/.68	6/.64	6/.70	6/.75	6/.81	7/.78	7/.83	8/.80	9/.84	10/.84	10/.94	12/.93
Span, ft.	18	6/.65	6/.72	6/.78	7/.76	7/.82	8/.77	8/.82	8/.90	9/.94	10/.95	12/.87	15/.83
Span, ft.	19	6/.73	6/.80	7/.78	7/.84	8/.80	8/.86	9/.84	9/.92	10/.95	12/.87	12/.97	15/.93
Span, ft.	20	6/.81	7/.79	8/.76	8/.82	8/.89	9/.87	9/.93	10/.91	12/.86	12/.97	15/.86	15/1.03
Span, ft.	21	7/.79	8/.77	8/.85	8/.91	9/.89	10/.86	10/.92	12/.83	12/.95	15/.85	15/.94	.....
Span, ft.	22	8/.77	8/.84	9/.84	9/.91	10/.88	10/.94	12/.83	12/.91	15/.83	15/.93	15/1.04	.....
Span, ft.	23	8/.84	9/.84	9/.91	10/.89	10/.96	12/.85	12/.91	12/.99	15/.90	15/1.02	.....	.....
Span, ft.	24	9/.84	9/.92	10/.90	12/.80	12/.87	12/.93	12/.99	15/.87	15/.99	.....	.....	.....
Span, ft.	25	9/.91	10/.89	12/.81	12/.87	12/.94	12/1.00	15/.86	15/.94	15/1.07	.....	.....	.....

WEIGHT OF COMBINATION SLABS PER SQUARE FOOT.

Tile.....	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.	15 in.
Weight.....	45 lbs.	50 lbs.	55 lbs.	60 lbs.	65 lbs.	70 lbs.	75 lbs.	80 lbs.	90 lbs.	105 lbs.

The load tables are for general information only, as each particular operation should be designed in accordance with actual conditions. Other 'Load Tables' and other types of floor systems shown in our literature on "Long Span" Floors.
The engineering department is at the entire disposal of anyone desiring further information.



**DETAIL OF TYPICAL LONG SPAN COMBINATION HOLLOW TILE AND REINFORCED CONCRETE FLOOR
CARRIED ON STEEL I BEAMS.**

BUILDINGS OF NATCO HOLLOW TILE.

The value and economy of Natco Hollow Tile for structural as well as for fireproofing purposes is now fully recognized, and Residences, Factories, Warehouses, etc., are being built of this material in great numbers, with extremely satisfactory results to owners and architects.

It should be borne in mind that there is a vast difference in clays, as to strength, density and correct manufacturing methods, and, in order to be sure of obtaining material manufactured by us, architects should specify NATCO HOLLOW TILE, and thus secure the benefits of our long and extensive experience.

NATCO LOAD BEARING WALL TILE.

Natco Load Bearing Wall Tile realizes the LAST degree of structural efficiency, its design being such that, when set up in cement mortar, it virtually forms two separate walls joined with connecting webs. The continuous vertical insulation is worthy of the most careful consideration. Plaster or stucco is applied direct to the dovetailed scored surfaces of the tile, yielding an absolutely fireproof wall.

NATCO WALL TILE—MULTICELL SHAPE.

The use of Natco Wall Tile offers specially marked advantages which will effect a large saving in cost of labour and mortar over brick and all other types of hollow tile for exterior wall construction.

ADVANTAGES.

1. The large Natco units erect a wall with less labour and mortar than smaller tile, which require from 2.4 to 2.5 tile to equal the area (exclusive of mortar joints) of an 8" Natco Wall Tile.
2. Mortar applied to wide bedding surfaces, insuring tight horizontal and vertical joints. The absence of through joints ensures complete insulation.
3. The multicell walls will withstand more hard usage and less likely to break than tile with thin walls.
4. Ease of using flat tile jack arches over openings less than 5' effects marked saving over reinforced type of lintels.
5. Ease of erecting pipe chases and cutting for conduits.
6. Simplicity of construction at jambs, corners, junction of walls and on walls of multiple thickness.
7. Special tile for circle headed windows, arches, belt courses, etc.



8" X 12" X 12" WALL TILE



12" X 12" X 12" WALL TILE.

NATCO ENCLOSURE WALL TILE.

The use of the Natco Load Bearing Tile, in conjunction with the Natco Header Backer, offers special marked advantages, because of the ability to cut the "Filler" in varying lengths.

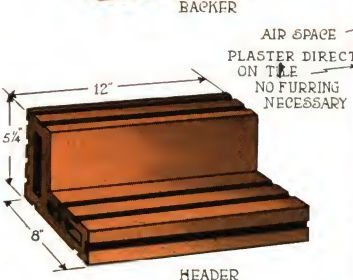
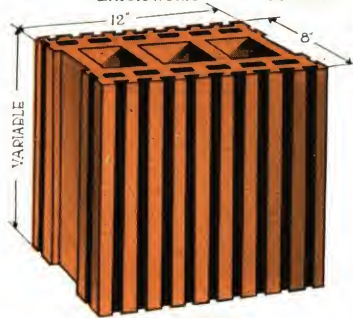
NATCO ENCLOSURE WALL TILE FOR WALLS OF ANY HEIGHT AND SIZE VENEERED WITH BRICK.

ADVANTAGES.

1. Ability to work to any Bond and Storey Height without cutting or use of slabs.
2. Full 8-in. wall bearing for floor joists.
3. Confined VERTICAL air pockets prevent moisture penetration and continuous mortar joints.
4. Decreased dead loads compared to Brick Backing.
5. Mortar may be applied to flat under surface of "Header Backer."
6. Vertical cell construction offers increased strength.

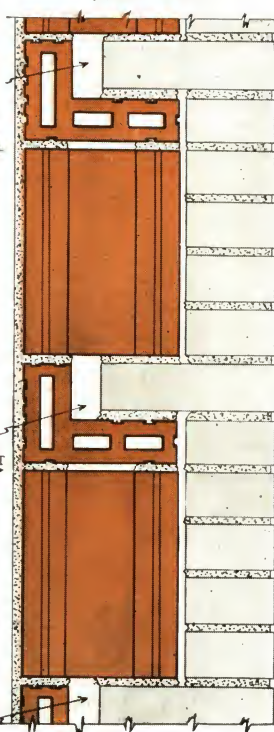
DETAIL NATCO ENCLOSURE WALL TILE

FOR BACKING UP
BRICK WORK



ADAPTABLE TO
ANY THICKNESS OF WALL
FROM 13 UP

NOTE
ABSENCE OF CONTINUOUS
MORTAR JOINTS



ADVANTAGES.

7. Ease of using FLAT tile jack arches over openings less than 5 feet effects marked saving over reinforced type of lintel.
8. Ease of erecting pipe chases and cutting for conduits.
9. Rapidity of construction—Reduced cost of setting.
10. SIMPLICITY of CONSTRUCTION at jambs and corners and on walls of multiple thickness.

NATCO
PUBLICATIONS.

Copies of our various publications furnished upon request.

THE INTERLOCKING TILE COMPANY, LIMITED

MANUFACTURERS AND DISTRIBUTORS OF INTERLOCKING TILE.

32 TORONTO STREET, TORONTO, ONT.

ALSO MERKLEY'S, LIMITED, OTTAWA, ONTARIO, LICENSEE.

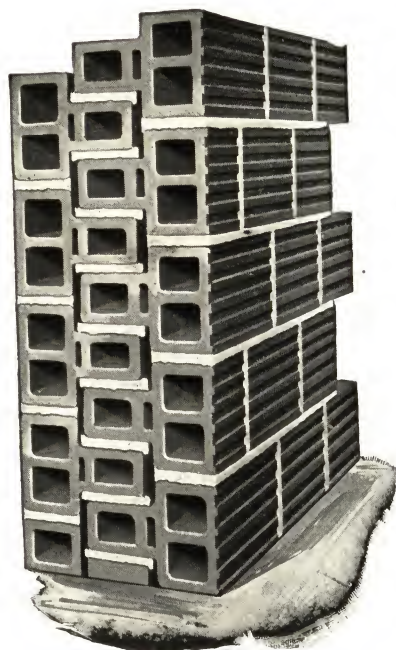
(PATENT No. 137854.)

PRODUCT.

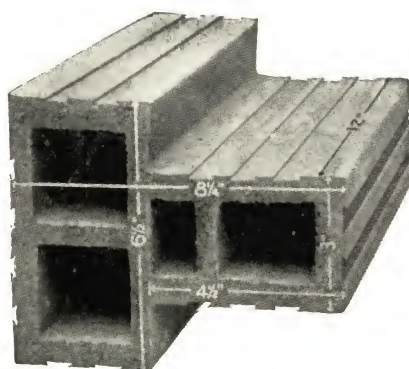
INTERLOCKING TILE is a LARGE HOLLOW BRICK so designed as to permit of the brick mason placing it in the wall with one hand on horizontal mortar beds, as is his customary practice with brick. It is manufactured from Shale, burned to semi-vitrification, and is used for bearing walls to replace common brick. The Tile is made with deeply grooved keys to hold interior plaster or exterior stucco, or with smooth faces for exposed work. No furring is required. One shape and size builds all desirable thicknesses of walls. The wonderful stability of the Interlocking Tile Wall is due to the four-inch mortar beds and its PATENTED INTERLOCKING system. No mortar joints extend through the wall. This feature, together with the horizontal dead-air pockets, renders the Interlocking Tile Wall impervious to the penetration of moisture, heat, cold, sound, etc. The weight of the wall and laying-up cost is about one-half that of solid brick walls.

No other tile combines these important features.

COLOR—RED.



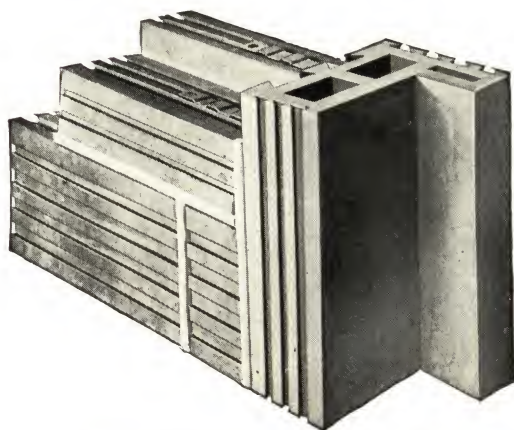
USED FOR LOAD BEARING WALLS AND PARTITIONS TO REPLACE 13" SOLID BRICK.



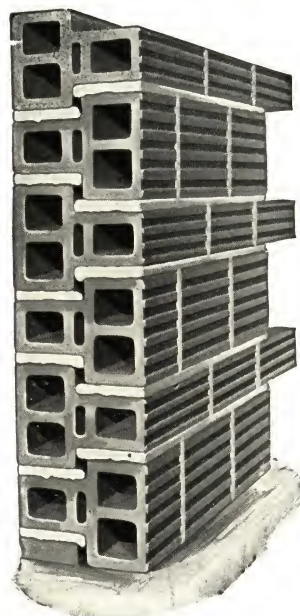
"IT INTERLOCKS."



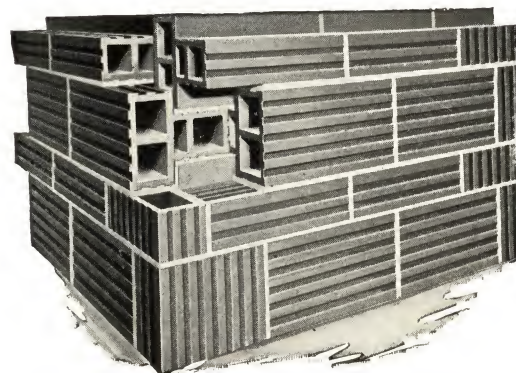
13" WALL: FOUR INCHES FACING BRICK WITH 8" INTERLOCKING TILE BACKING. USED FOR EXTERIOR LOAD BEARING WALLS, SCHOOLS, HOSPITALS, ETC. FOR SPANDREL WALLS OF STEEL OR CONCRETE FRAME B'LDGS. FOR RESIDENCE FOUNDATIONS.



APPLICATION OF JAMB TILES WITH METAL TIES.



NINE INCH WALL. USED FOR LOAD BEARING WALLS, RESIDENCES, ETC., TO REPLACE 9" SOLID BRICK.



BONDING OF WALL AT CORNER. CORNER TILE OMITTED IN UPPER PART TO SHOW MANNER OF BONDING.

It is the Vertical Webs that must carry the Loads. To get their full strength they must stand over each other. (Notice the cuts.)

WEIGHT.

Weight of wall, inclusive of mortar, 60 pounds per cubic foot, one half the weight of brick wall. Load allowance, Toronto Building Code, 7 tons per running foot of wall. Factors of safety 9.

ORDERING.

Each Interlocking Tile displaces 444 cubic inches, and is therefore equal to $5\frac{1}{2}$ Toronto Brick or 7 American Standards. For 9" walls 2.1 Tile lay one square foot (face of wall measure): 3.3 Tile lay one square foot of 12" wall. When Interlocking Tile is used to back up Face Brick the above quantities are reduced 10% by the Through Brick Headers.

INFORMATION.

Cost Data, detail drawings, catalogs, samples and prices on request. WE ALSO MANUFACTURE TERRA COTTA PARTITION TILES.

DOMINION BRIDGE CO., LIMITED

Head Office and Works:
LACHINE LOCKS, P.Q.

Cable Address:
"DOMINION"

P.O. ADDRESS:
MONTREAL, P.Q.

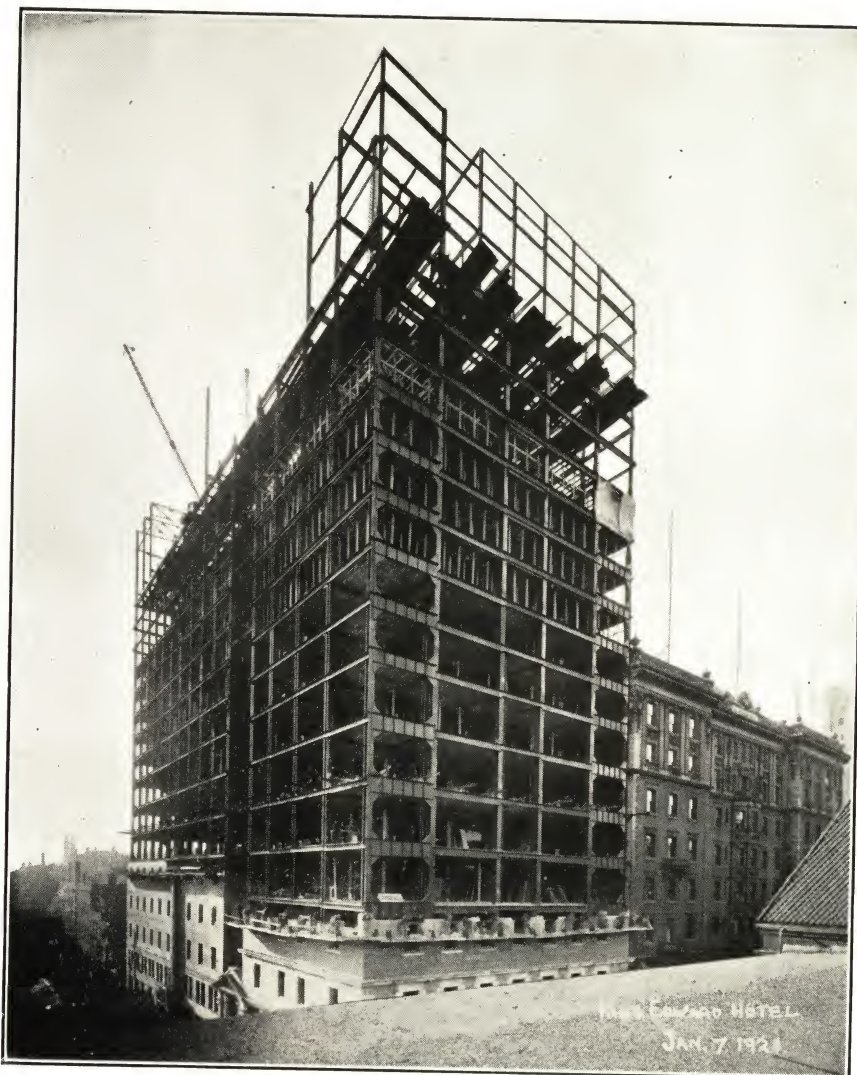
Branch Offices and Works:
TORONTO, OTTAWA AND WINNIPEG.

Sales Offices:
MONTREAL, OTTAWA,
TORONTO, WINNIPEG,
EDMONTON, REGINA,
VANCOUVER.

ENGINEERS, MANUFACTURERS AND ERECTORS OF STEEL STRUCTURES.

PRODUCTS.

RAILWAY AND HIGHWAY BRIDGES (SWING AND BASCULE SPANS); BUILDINGS OF ALL KINDS; PLATE AND TANK WORK OF EVERY DESCRIPTION; TRANSMISSION POLES AND TOWERS; TURN-TABLES; ELECTRIC AND HAND POWER CRANES; HOISTING APPLIANCES; LIFT LOCKS; HYDRAULIC REGULATING GATES; TURBO ALTERNATORS; TURBO BLOWERS; GEAR CUTTING AND GENERAL MACHINE WORKS.



KING EDWARD HOTEL, TORONTO
2600 TONS FABRICATED AND ERECTED BY US. ERECTED IN 92 WORKING DAYS

ILLUSTRATION.

The erection of the new eighteen-story annex to the King Edward Hotel, Toronto, is one of the latest of the many examples of the unequalled efficiency of Structural Steel as applied to building construction. The speed of erection of the Structural Steel on this large building could not have been attained with any other type of frame work.

STRUCTURAL STEEL is THE FASTEST PERMANENT CONSTRUCTION in the world and is the most SCIENTIFICALLY RELIABLE CONSTRUCTION in existence.

LARGE STOCK of Structural and Warehouse Material at ALL PLANTS.

MACKINNON STEEL CO., LIMITED
SHERBROOKE, QUE.

ENGINEERS, MANUFACTURERS AND ERECTORS OF STEEL PLATE AND STRUCTURAL
WORK OF EVERY DESCRIPTION.



SKATING RINK, MONCTON, N.B. 200 TONS STEELWORK.
CONTRACT AWARDED NOV. 3RD 1921.—ERECTION COMPLETED JAN. 16, 1922.

PRODUCTS.

STRUCTURAL STEEL for office buildings, factories, apartments, churches, rinks.

STRUCTURAL STEEL FOR BRIDGES, highway, railway and bascule spans.

PLATE WORK, tanks, smokestacks, penstocks, dryers, barking drums, diffusers, hoppers, coal bunkers, chutes, draft tubes, etc.

McGREGOR & McINTYRE, LIMITED

STRUCTURAL STEEL AND ORNAMENTAL IRON WORKS

1139 SHAW STREET,
TORONTO, ONT.

PRODUCTS.

STRUCTURAL STEEL for office buildings, mill buildings, grand stands, rinks, churches, etc.

STRUCTURAL STEEL BRIDGES, both highway and railway.

FIRE ESCAPES.

ELEVATOR ENCLOSURES.

SIDEWALK DOORS.

AREA GRATINGS.

AUTO CURB PLATES.

STEEL STAIRS of patented steel trough construction.

ORNAMENTAL IRON WORK of all descriptions.

STOCK.

Steel Beams, Channels, Column Sections' Angles, Plates, Checkered Plate, Bars always in stock.

CAPACITY.

Our annual capacity is 16,000 tons per annum. A special feature of our shop is our SHORT ORDER DEPARTMENT, organized to handle quickly and without the routine of a large shop, orders which are required in a very short time.

REFERENCES.

Some contracts we have executed:

Goodyear Tire and Rubber Co., New Toronto
(7,000 tons)
Methodist Book Room, Toronto (3,000 tons).
Excelsior Life Building, Toronto.
St. Clair Avenue Bridge, Toronto.
Grand Stand, London.
Dominion Sugar Co., Chatham.
Rolph Clark Building, Toronto.

SAFETY GRATINGS.

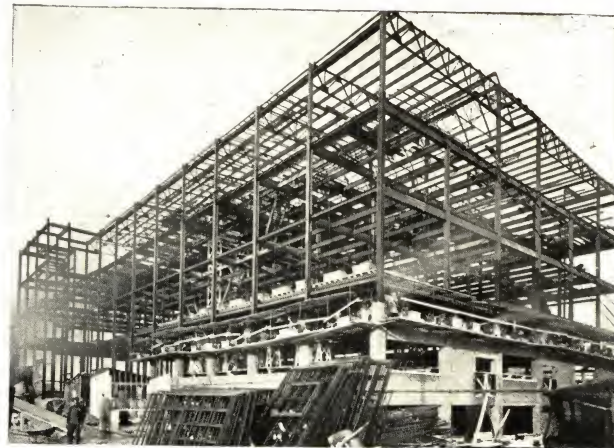
M. & M. Safety Gratings are made of $\frac{3}{8}$ inch square steel cross bars spaced $\frac{3}{4}$ of an inch apart, supported and braced at 4-inch intervals by V-shaped longitudinal members, the ridges of which stand up very slightly above the general level of the grating surface, thereby affording a safe footing and perfect security against side slipping.

STEEL TROUGH STAIRS.

The essential feature of STEEL TROUGH STAIR lies in the construction of the steps, which provides a steel riser combined in one piece with a steel soffit plate that follows the rake of the stairs. These combination riser and soffit plates when assembled present a series of triangular troughs, closed at both ends by the supporting stringers, ready to be filled with any suitable plastic material the top surface of which constitutes the wearing tread.

ESTIMATES.

DESIGNS AND ESTIMATES FURNISHED.



GOODYEAR TIRE & RUBBER CO'S FACTORY, NEW TORONTO.



M & M SAFETY GRATING OVER SIDEWALK AREA.



STEEL TROUGH STAIRS FOR THE T. EATON COMPANY, LIMITED.

REID & BROWN

STRUCTURAL STEEL AND IRON WORKS, LIMITED

63 ESPLANADE EAST,
TORONTO, ONT.

PRODUCTS.

STRUCTURAL STEEL for all classes of buildings, Churches, Factories, Grain Elevators, Mines, Grand Stands, etc.

STRUCTURAL STEEL BRIDGES both Structural and Reinforcing Steel.

REINFORCING STEEL for Buildings, Bridges, etc.

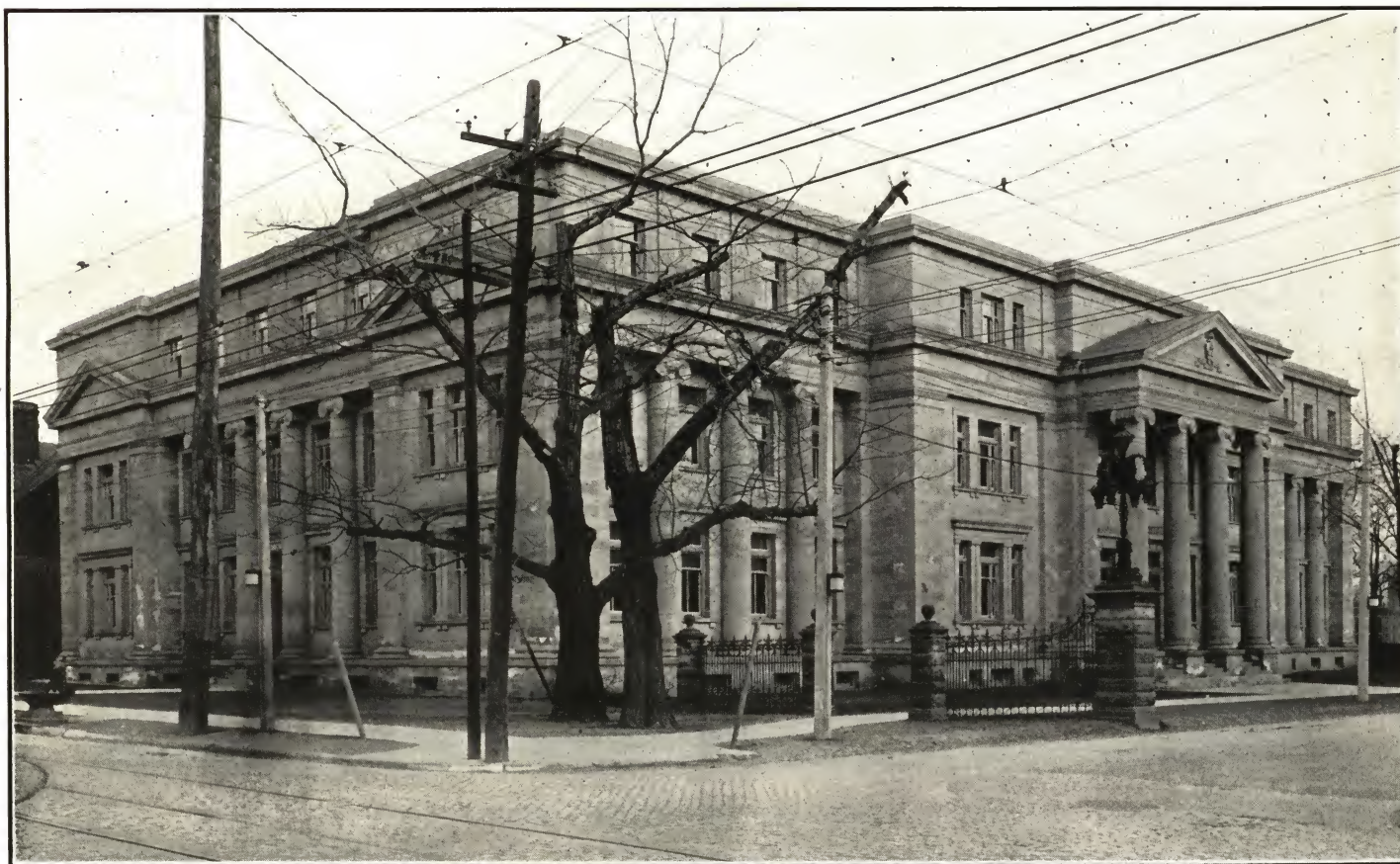
SIDE WALK DOORS and GRATINGS.

AUTOMOBILE TURNTABLES and CURBPLATES.

AUTOMOBILE DUMP BODIES and REPAIRS.

GREY IRON CASTINGS of all descriptions.

SEMI-STEEL CASTINGS.



350 TONS OF STEEL. LILLIAN MASSEY SCHOOL OF DOMESTIC SCIENCE.

STOCK.

We carry a large stock of Steel Beams, Channels, Column Sections, Angles, Plates, both plain and checkered, Rounds, Flats, and Reinforcing Steel, from which we can make immediate delivery.

PLANT.

Our Plant is centrally located, being only five minutes' walk from the King Edward Hotel. We are located on the water front and can ship either lake or rail. Our plant is equipped with the most modern equipment, which puts us in a position to give the best service possible.

Estimates and designs on request.

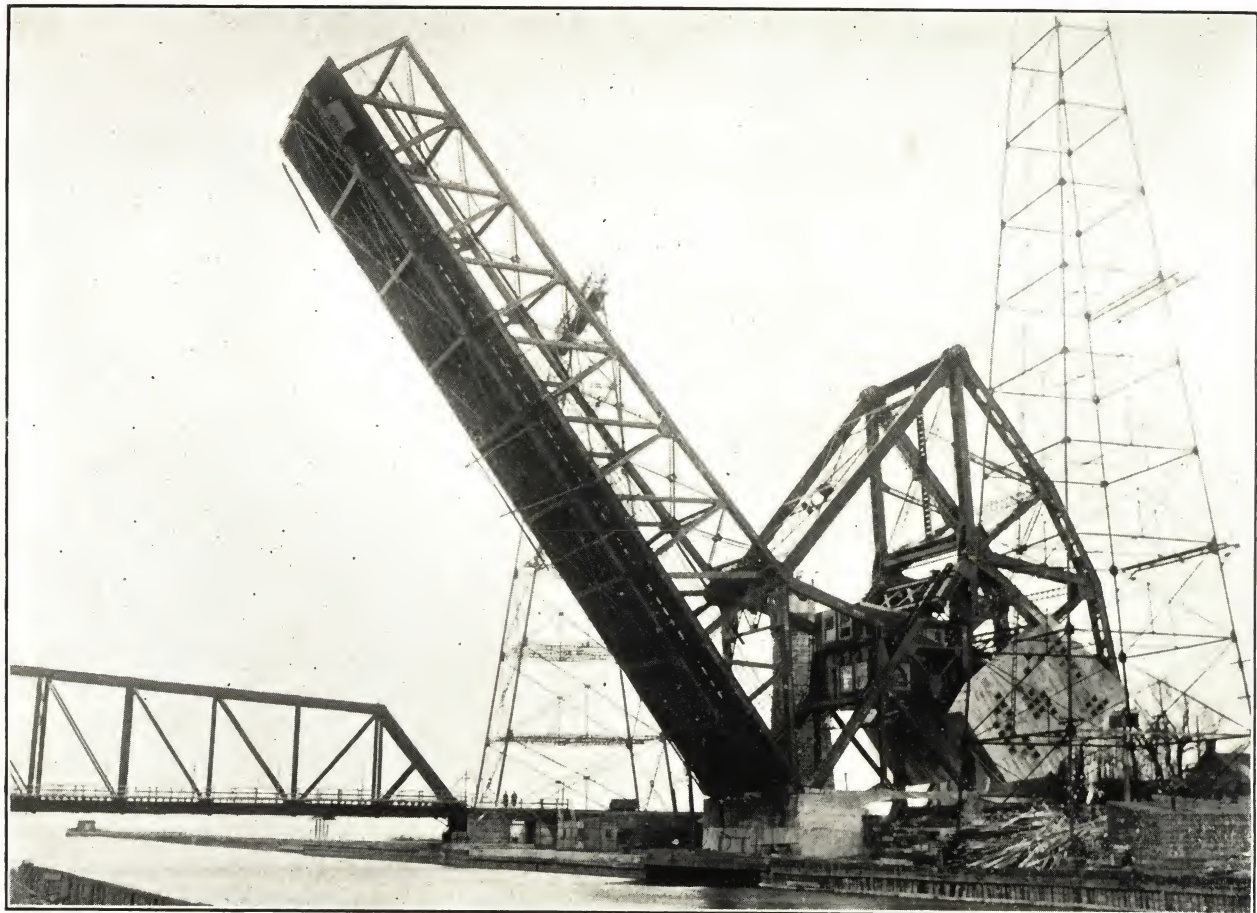
THE HAMILTON BRIDGE WORKS COMPANY, LIMITED

HEAD OFFICE:
BAY AND BARTON STREETS,
HAMILTON, ONT.

ENGINEERS, CONTRACTORS,
MANUFACTURERS.

PRODUCTS.

Designers and Builders of RAILWAY AND HIGHWAY BRIDGES, STEEL FRAME BUILDINGS for Offices, Warehouses, Factories and other purposes. METALLIC STRUCTURES for all purposes.



BASCULE BRIDGE OVER BURLINGTON CHANNEL, HAMILTON BEACH, RECENTLY COMPLETED BY US.

FABRICATING PLANTS.

Shop A—capacity 18,000 tons; Shop B—6,000 tons; Shop C—12,000 tons per annum.

STOCK.

A large stock of structural shapes and plates, is carried and we can make quick deliveries of Fabricated Steel of any description.

ERECTION.

With a large fleet of derrick cars, erection cranes, compressor cars, boarding cars, etc., we are able to handle many large contracts simultaneously.

REFERENCES.

We are extensive Contractors to the Canadian Pacific Railway, Grand Trunk Railway System, Canadian National Railway Systems, and many others.

HEPBURN & DISHER, LIMITED

OFFICE:
71 VAN HORNE STREET
TORONTO, ONT.

WORKS:
40-60 VAN HORNE STREET
TORONTO, ONT.

PRODUCTS.

STRUCTURAL STEEL, BEAMS, GIRDERS, COLUMNS, TRUSSES, LINTELS, WALL PLATES, BUILDERS' IRONWORK.

We are also sole agents for "DUPLEX" JOIST AND WALL HANGERS, POST CAPS, POST BASES, WALL PLATES, WALL BOXES, WALL TIES, WALL ANCHORS, STRAPS, Etc.

FACILITIES.

We carry a large stock of all sizes of beams, channels, angles, plates, etc., from which we are in a position to make prompt deliveries. We also have splendid facilities for manufacturing to the designs submitted by Architects and Engineers.

We specialize in rush contracts.



TORONTO WINTER CLUB
568 DUPONT ST.
TORONTO, ONT.

Trusses 76 ft. Span, Columns 24 ft. High.
Building 182 ft. Long.
Structural Steel Fabricated and Erected by Us in Record Time.

LANGLEY & HOWLAND
ARCHITECTS
TORONTO, ONT.

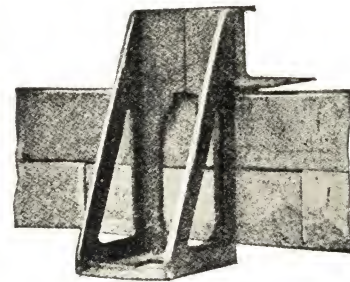
"DUPLEX" JOIST AND WALL HANGERS.



"DUPLEX" JOIST HANGER.

The "Duplex" joist hanger is superior to the old methods of framing by mortise and tenon. It also has greater efficiency than wrought iron stirrups and steel hangers, in so much that it retains the full strength of the timber. The application of the "Duplex" hanger is very simple, the timber being bored at or above its neutral axis, and the malleable lug of the hanger placed in the hole, filling it completely.

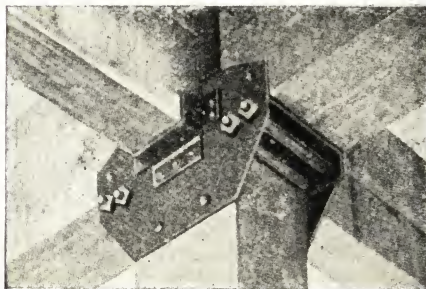
The "Duplex" wall hanger is now used extensively as a great improvement over the old method of anchoring timbers to masonry walls. It absolutely renders timbers self-releasing in case of fire, increases the bearing timbers on the walls and maintains a secure anchorage.



"DUPLEX" WALL HANGER.

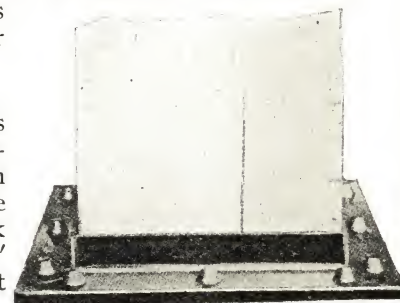
"DUPLEX" STEEL POST CAP.

In this cap we have the most perfect column and girder that it is possible to obtain. The cap is made of mild open hearth steel and consists of three pieces, bolted together with four heavy bolts. The weight of the girder is carried on the shoulder formed on the post. The heavy bolts underneath the bearing bracket relieve the outer edge of the bracket and transmit the load direct to the post. The outer bolt is directly under the plate of the bearing bracket, while the inner bolt is close against the post. This forms a truss of the bolts, plates and bracket. Tests have proved that it is impossible to break the Cap when even more than six times the ultimate safe load of the timber has been applied.



"DUPLEX" POST CAP FOR FOUR WAY CONSTRUCTION.

The "Duplex" steel post base is made of steel plates and angles riveted together to fit the post and is much more economical than the old style cast iron base. We carry sizes in stock to fit from a 6"x6" post to a 20"x20" post. Larger sizes made up on short notice.



"DUPLEX" STEEL POST BASE.

"DUPLEX" STEEL POST BASE.

THE ROOFERS' SUPPLY CO., LIMITED

SHAW & DUPONT STS.

TORONTO

BRANCH OFFICE—137 MCGILL ST., MONTREAL

PRODUCTS.

We are manufacturers of and dealers in SHEET METALS (including BLACK AND GALVANIZED SHEETS, COPPER SHEETS, TINPLATE, ZINC SHEETS), ROOFING MATERIALS, ROOFERS' SUPPLIES, BLACKBOARDS, WIRED GLASS, Etc

SHEET METALS.

Our Black and Galvanized Sheets are made with a copper content which gives them three to five times the life of ordinary sheets. These are supplied to Manufacturers, Tinsmiths, Roofers, etc., for manufacturing into many articles. They are particularly useful for roofing work, gutters, downpipe, flashing, etc.

COPPER SHEETS.

Complete stocks of both Soft and Cold Rolled Copper carried in stock, plain and tinned one side. Copper used extensively for roofing, flashing, etc., where long life is essential.

TIN PLATE.

Large stocks of standard sizes and weights carried in stock.

FIRE DOOR TERNE PLATE.

For covering Fire Doors.

ROOFING MATERIALS.

FELT AND GRAVEL ROOFS—Large quantities of Felt, Pitch, Tar, Gravel, etc., carried on hand for all classes of flat roof work.

SPECIFICATION No. 1

Lay one ply of dry felt or sheathing, over this two plies of tarred felt, medium weight, swabbed between each sheet with hot pitch, then swab the whole surface with a good coat of boiling pitch; lay another two plies of tarred felt, swabbed between sheets, and a second flowing coat of hot pitch. When last coat of pitch is set, swab on a light coat of hot coal tar, and evenly spread over the whole, clean gravel to a depth of $\frac{5}{8}$ of an inch.

SLATE.

The cheapest covering for a pitched roof in the long run. No painting or repairing. Can be specified in black, green, purple, red, mottled green and purple. We are Canadian agents for Sheldon's Slates, the largest manufacturers of colored slate in the Vermont region.

SPECIFICATION FOR SLATE ROOFING.

Put in strong valley rafters. Tongue and grooved sheathing is not necessary, only have your boards even in thickness, your roof one-quarter pitch or upwards. Line your valleys 20 inches wide at bottom and 15 inches at top with galvanized iron. Chimneys should always have a saddle at back; step and cloak flash at all intersections around brick work, and cover ridges with galvanized iron. Have your eave-troughs so hung that the outside edge will be $\frac{1}{2}$ inch below the run of the roof, so that ice or snow may slide clear. Lay over boarding one ply Slaters' Felt, then cover with "Roofers' Supply Company's No. 1 Roofing Slate" (in black, green, mottled or red), and you will have a good roof for ever. A square contains sufficient slate to cover 100 square feet.

TILE.

The highest class roof which can be put on. Costs more than other roofings, and worth it. Can be secured in variety of patterns and colors. We are agents for Ludowici-Celadon Co. of Chicago. Write for booklets and literature on tile.

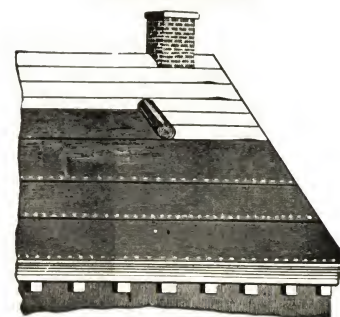
ROOFERS' SUNDRIES.

Pipe, Trough, Ridge, Tools, Cement, etc.

READY ROOFING.

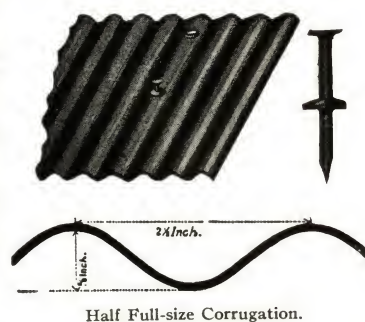
For sloping roofs on factories, freight sheds, barns, etc., there is nothing better than our prepared wool felt asphalted roofings. Each roll contains sufficient to cover 100 square feet of roof, also the necessary nails and liquid asphalt for sticking laps. On roofs where there is a short rafter, this style of roofing is often laid from ridge to eave, but we recommend starting at the eave; let the roofing project over eave about 2 inches, and we advise rolling out along roof; stretch tight so as to avoid wrinkles, drive a few nails along top edge to hold in position, the bottom edge can then be turned up and liquid run along; stick down and nail about every 3 inches. This is the most satisfactory way to apply Ready Roofings. Write for samples and prices of Roofers' Supply Company's Ready Roofing.

Ready Roofings



CORRUGATED GALVANIZED IRON.

The use of Corrugated Galvanized Iron is increasing steadily each year, as architects and builders recognize in it a very serviceable material for roofs and siding of warehouses, elevators, barns, etc. The iron may be applied to sheeting of wood or direct to iron or wood purlins. Any gauge can be supplied from 18 to 28, weight depending on gauge, from 75 to 240 lbs. per 100 square feet of iron. All our sheets are corrugated from the very best quality of sheets made for that purpose; they are uniform in size, and the corrugations, being pressed by very heavy machinery, fit exactly. Two sizes of corrugations can be supplied, $2\frac{1}{2}$ inch x $\frac{5}{8}$ inch and 1 inch x $\frac{1}{4}$ inch. The sizes of sheets kept in stock are 6, 8 and 10 feet long, the widths depending on the size of corrugation used. Sheets corrugated $2\frac{1}{2}$ inches x $\frac{5}{8}$ inch are $27\frac{1}{2}$ inches and 33 inches wide; sheets corrugated 1 inch x $\frac{1}{4}$ inch are $26\frac{1}{2}$ inches and 32 inches wide. Odd-sized sheets can be supplied at extra cost.



Half Full-size Corrugation.

Quotations from us are based on 100 square feet of iron after corrugating, no allowance being made for laps, the pitch or angle of roof having a great deal to do with the amount of lap required. We recommend for roofs that are known as quarter pitch or 3 inches to the foot, 3 inch end lap and two corrugations side lap. This makes the covering width of a sheet 33 inches wide ($2\frac{1}{2}$ inch x $\frac{5}{8}$ inch corrugations) $28\frac{1}{2}$ inches. For siding we give an end lap of 2 inches and side lap of one corrugation, this makes the covering width of a sheet $30\frac{1}{2}$ inches. Allowing for the different laps indicated above, 121 square feet of iron is required to cover 100 square feet of roof, and 110 square feet of iron is required to cover 100 square feet of siding.



Half Full-size Corrugation

Where sheeting is not used, space the purlins not more than 2 feet 6 inches for 26 gauge iron, from 3 feet to 4 feet for 24 gauge, from 4 feet 6 inches to 6 feet for 22 gauge, and from 6 feet to 8 feet for 20 gauge.

A special fastener is required for iron purlins.

We recommend our Lead Washer for use under nail head when applying corrugated iron to a roof. They make an absolutely water-tight joint and prevent rust from accumulating under the nail head. One pound is required for two or three squares. The additional cost per square of doing a job with these washers is trifling, while a perfect job is made. The application is shown in the forgoing cut.

Quotations for Corrugated Galvanized Iron delivered F.O.B. any point will be mailed upon application. We also supply Black Corrugated Sheet, painted, for which we will be pleased to receive your enquiries.

SLATE BLACK-BOARDS.

Our Slate Blackboards are made from the Bangor, Pa., "Big Beds," best in the world for this class of work.



In ordering, be sure and give the exact length of space to be filled, and the width of board required. Our boards are smooth and flat, easily set up in position. The cut shows clearly the best method of setting up. See that joints are even on surface before nailing up the quarter-round stops. Prices furnished on application.

SLATE TREADS AND LANDINGS.

We supply Treads and Landings for stairways, etc. Enquiries for prices must state exact size and thickness required. The usual thickness for this class of work is $1\frac{1}{4}$ inches, and the slate in general use is that known as ribbon stock, being cheaper and just as serviceable as clear stock.

WIRED AND ROUGH ROLLED GLASS.

Wired Glass has come into very general use for fireproof windows, also for skylight work. We carry a large stock of the Wired and also of the Ordinary Rough Rolled Glass, 3-16 inch and $\frac{1}{4}$ inch thick. The Wired Glass in general use is $\frac{1}{4}$ inch thick. We also supply to order Clear Wired Glass, which is used for elevator doors and also for office windows. This Clear Wired being rather expensive, is not carried in stock, but is cut to order. Contrary to the general impression that is held concerning Wired Glass, it is cut with very little more trouble than the ordinary glass; in fact, the percentage of breakage in cutting Wired Glass is actually less with us than in cutting the ordinary Rough Rolled, and for skylight work, particularly large skylights, there is nothing to compare with the Wired Glass, as it retains its place and remains water-tight when cracked in two or three places in the one light. As a preventive against fire for partition work or in metal windows it has been found invaluable, and where used reduces the premium on insurance very materially. In writing for prices give exact size and quantity.

LUDOWICI-CELADON COMPANY

MANUFACTURERS OF
SHALE ROOFING TILES.

GENERAL SALES OFFICE: MONROE BUILDING,
CHICAGO, ILL.

BRANCHES:

CLEVELAND, O.	. . .	UNION BLDG.	WASHINGTON, D.C.	. . .	UNION TRUST BLDG.
PITTSBURG, PA.	. . .	PARK BUILDING.	NEW YORK CITY, N.Y.	. . .	225 LEXINGTON AVE.

REPRESENTATIVES:

MANITOBA AND NORTHWEST:	EASTERN CANADA:	BRITISH COLUMBIA:
SUPPLY AND FUEL CO., LIMITED, WINNIPEG, MAN.	THE ROOFERS SUPPLY CO., LTD., TORONTO, ONT.	EVANS, COLEMAN & EVANS, LTD., VANCOUVER, B.C.

In addition to the Roofers Supply Co., Limited, Toronto, representing us in Eastern Canada (from Quebec to Windsor, Ont.), our own travelling representative calls in person on all architects, and will call on builders and owners upon request.

PRODUCTS.

We manufacture SHALE ROOFING TILES in all standard shapes, including the Spanish, Shingle and French patterns. With these tiles we furnish all necessary fittings.

CHARACTER.

All these Tiles are made of shales, and subjected to high degrees of heat after painstaking preparation for the kilns. They are devised to interlock in the only practical and effective manner, so that water is carried to the surface of the next lower tile. Their durability is established by the only unassailable verdict—the test of time. The first product of this Company was put on the American market thirty-three years ago at the rate of possibly three hundred squares per *month*; at present, the output of our factories is approximately six hundred and fifty squares per *day*, an unmistakable evidence that builders recognize the merits of our ware.

COLOURS.

The standard colour of Roofing Tiles is terra cotta red. The greater development of colour study in building has opened a field for glazed roofing tiles, of which we make a very complete line. Aside from the high glazes, we furnish full glazes in satin finish and dull or matt greens.

ESTIMATES AND SPECI- FICATIONS.

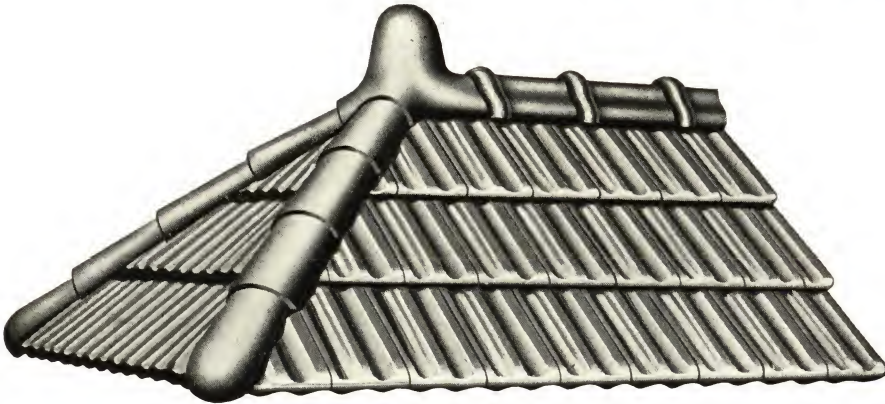
We shall be pleased to furnish catalogue and estimates on application, but inquiries for complete estimates should be accompanied with roof plan and the four elevations. We shall be very glad also to supply suggestions as to specifications for our different patterns, and have these in printed form, so that immediately upon receiving such request we can mail specifications to those desiring to use Roofing Tiles.

INFORMA- TION.

All inquiries for information should be addressed to the Main Office in Chicago. If the services of a salesman or estimator are required, please advise by mail, or by wire if the case is urgent.

IMPERIAL SPANISH TILE

with mission eave closures
and top fixtures
152 hip starter
102 hip roll
215 ridge and
405 two-way terminal.



IMPERIAL FRENCH TILE

with 152 hip starter
102 hip roll
206 ridge and
405 two-way terminal.

IMPERIAL CLOSED SHINGLE TILE

with 161 hip starter
111 hip roll
203 ridge and
250 two-way terminal.



SPECIFICATIONS.

All pitched roofs shall be covered with [Insert Name of Pattern] Tiles made by the Ludowici-Celadon Company with stock fittings suitable for each pattern. The tiles as specified above must be hard burned, of colour, and in accordance with samples deposited in the office of the architects.

PREPARATION
OF ROOF.

Before the roofer is sent for, the owner or general contractor should construct roofs in strict accordance to plans, sheath the roofs TIGHT, have all chimneys and walls above roof line completed, have all vent pipes put through roofs, furnish all strips of required width used under hip rolls, furnish any strips that may be used under tile at eaves, and have all scaffolding ready for roofer's use. The metal contractor should have all gutters in place on the roof (gutters, whether box, hanging or secret, to extend over the roof sheathing, and run under the felt and tile at least eight (8) inches), and should also have in place all valley metal, the width of which must be not less than 24 inches, with both edges turned up $\frac{1}{4}$ inch the entire length of the valley, the valley metal to be fastened with clips and never nailed or punctured in any manner. The valley metal must be laid over one layer of felt running lengthwise the entire distance of the valley. The metal contractor must have in readiness all flashing metal used along side and in front of dormers, gables, skylights, towers, perpendicular walls, also around vent pipes and chimneys, and place same after the arrival of the tile roofer and in accordance with the requirements of the tile.

LAYING OF FELT.

After the roofs have thus been prepared to receive the felt and tile, the tile roofer shall cover the sheathing of the roofs with one thickness of asphalt roofing felt weighing not less than 30 pounds to the square, laying same with a $2\frac{1}{2}$ -inch lap and securing in place by capped nails. The felt should be laid parallel with the eaves and lapped over all valley metal about 4 inches and laid under all flashing metal about 6 inches.

LAYING OF TILE.

The roof having thus been prepared, the tile layer is to fasten tile with copper nails. The roofer shall see that the tiles are well locked together and lay smoothly, and no attempt shall be made to stretch the courses. The tiles must be laid so that the vertical lines are parallel with each other and at right angles to the eaves. The tiles that verge along the hips should be cut close against the hip board, and a water-tight joint made by cementing cut hip tile to hip board with elastic cement. Each piece of hip roll shall then be nailed to the hip board, and the hip rolls cemented where they lap each other. The interior spaces of hip and ridge rolls must not be filled with the pointing material.

BRANTFORD ROOFING CO., LIMITED

MANUFACTURERS OF BRANTFORD ASPHALT PRODUCTS.

HEAD OFFICE AND FACTORY: BRANTFORD, ONTARIO.

BRANCHES AT: TORONTO, MONTREAL. HALIFAX, WINNIPEG.

Specify Brantford Roofing for Durability and Economy.

PRODUCTS.

ROLL ROOFING.

BRANTFORD ASPHALT ROOFING.
BRANTFORD RUBBER ROOFING.
BRANTFORD LEATHEROID ROOFING.
STANDARD MOHAWK ROOFING.
BRANTFORD CRYSTAL ROOFING

SLATE ROOFING.

BRANTFORD ASPHALT SLATES.
BRANTFORD SLAB SLATES.

ROOFING ACCESSORIES.

BRANROCO ASPHALT SATURATED FELT.

CLIMAX SHEATHING PAPER.

BRANROCO LAP CEMENT.

SUPERIOR ROOF COATING.

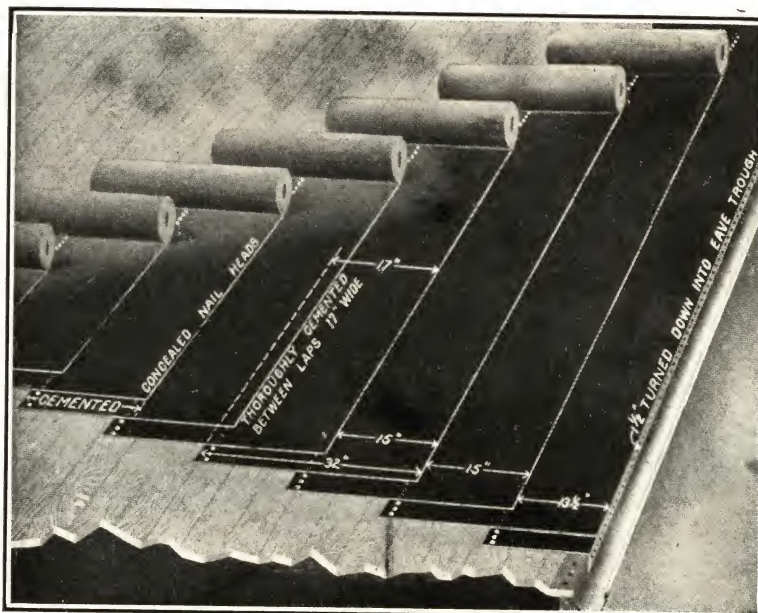
RED AND GREEN ROOF LEAK.

BRANTFORD PREPARED ROOFING is regarded as standard in building materials by engineers and architects. It is sold in rolls 32 inches wide and is laid with a two or three inch lap, or according to Brantford specification. Each roll contains sufficient nails and cement for laying. The weights are as follows:

No. 1 Brantford Asphalt
60 pounds per square.
No. 2 70 pounds.
No. 3 80 pounds.

No. 1 Brantford Rubber
40 pounds per square.
No. 2 50 pounds.
No. 3 60 pounds.

No. 1 Brantford Leatheroid
35 pounds per square.
No. 2 45 pounds.
No. 3 55 pounds.
No. 1 Standard Mohawk
40 pounds per square.



"BRANTFORD SPECIFICATION."

BRANTFORD SPECIFICATION (10 YEAR)

ON WOODEN CONSTRUCTION:

Brantford Asphalt No. 1, 60 pounds—32 inches wide is laid 15 inches to the weather, lapped 17 inches, thoroughly cemented between laps with Branroco Lap Cement; all nail heads are covered; roof when laid to receive one coat of Superior Roof Coating. For each square, (roof measurement) is required:

2 Rolls No. 1 Brantford Asphalt
1 1/2 Gallons Branroco Lap Cement
3/4 Gallon of Superior Roof Coating
1 pound (1 inch by 10) Roofing Nails.

BRANTFORD SPECIFICATION ON CONCRETE CONSTRUCTION.

Concrete roof must be properly graded with all depressions filled, all sharp projections removed, and finally swept off clean. Then the entire surface of concrete is covered with a bond coat of Branroco Lap Cement and Naphtha mixed thoroughly half and half. This coat fills all the pores in the concrete, waterproofing the surface, and provides firm adhesion for the coating of Branroco Lap Cement, which is next applied, and onto which is laid Brantford Asphalt No. 1—60 pounds—32 inches wide, 15 inches to the weather, lapped 17 inches, thoroughly cemented between laps with Branroco Lap Cement.

N.B. The second coat, Branroco Lap Cement, on the concrete surface can be applied as the work progresses, so that the Brantford Asphalt Roofing will be laid before the Cement is dry.

Roof when laid to receive one coat of Superior Roof Coating. For each square is required:

2 Rolls No. 1 Brantford Asphalt,
2 1/2 Gallons Branroco Lap Cement,
3/4 Gallon of Superior Roof Coating,
1/4 Gallon of Naphtha.

(NOTE). Bond coat requires 1/4 Gallon of Branroco Lap Cement and 1/4 Gallon of Naphtha mixed thoroughly, and is included in the above quantities.

N.B. Roll roofing on Specification roofs lays better when reverse side of roll is laid up to weather, especially in cool weather.



BRANTFORD SPECIFICATION (15 YEAR).

ON WOODEN CONSTRUCTION:

Over this Brantford Asphalt 50 pounds, 32 inches wide is laid 10 inches to the weather, lap 22 inches, thoroughly cemented between laps with Branroco Lap Cement; all nail heads are covered. Roof when laid to receive one coat Superior Roof Coating.

For each square (roof measurement) is required:

- 3 Rolls 50 pound Brantford Asphalt,
- $2\frac{1}{4}$ Gallons Branroco Lap Cement,
- $\frac{3}{4}$ Gallons Superior Roof Coating,
- 3 pounds (1 inch by 10) Roofing nails.

BRANTFORD SPECIFICATION (15 YEAR)

ON CONCRETE CONSTRUCTION:

Concrete roof must be properly graded with all depressions filled, all sharp projections removed and finally swept off clean. Then the entire surface of concrete is covered with a bond coat of Branroco Lap Cement and Naphtha mixed thoroughly half and half. This coat fills all the pores in the concrete, waterproofing the surface, and provides firm adhesion for the coating of Branroco Lap Cement which is next applied and onto which is laid Brantford Asphalt 50 pounds, 32 inches wide, 10 inches to the weather, lapped 22 inches, thoroughly cemented between laps with Branroco Lap Cement.

N.B. The second coat of Branroco Lap Cement can be applied as the work progresses, so that the Brantford Asphalt Roofing will be laid while the cement is tacky.

Roof when laid to receive one coat of Superior Roof Coating.

For each square is required:

- 3 Rolls 50 pound Brantford Asphalt,
- $3\frac{1}{4}$ Gallons Branroco Lap Cement,
- $\frac{3}{4}$ Gallons Superior Roof Coating,
- $\frac{1}{4}$ Gallon Naphtha.

NOTE: Bond coat requires $\frac{1}{4}$ gallon of Branroco Lap Cement and $\frac{1}{4}$ Gallon of Naphtha mixed thoroughly, and is included in above quantities.

BRANTFORD ASPHALT SLATES.

Specify Brantford Asphalt Slates and Brantford Asphalt Slab Slates for beauty, economy and long endurance. Brantford Asphalt Slates and Brantford Asphalt Slab Slates are manufactured from tough, long-fibred felt, thoroughly saturated with hot asphalt. Next a coating of high-grade asphalt is put on one side of the roofing, and on this asphalt while it is hot, a coating of finely crushed slate is imbedded, giving the roofing additional fire-resisting qualities and a soft permanent tint of green or reddish brown, depending on the color used.

Brantford Asphalt Slates are cut 8 inches wide and $12\frac{3}{4}$ inches long. They are laid 4 or 5 inches to the weather. They come in two colors, brownish red and dark green. One square laid five inches to the weather contains 342 slates, packed in bundles of 114 slates. One square 4 inches to the weather contains 424 slates, packed in 4 bundles, 106 slates each.

Brantford Asphalt Slab Slates are cut 32 inches long, 12 inches wide, the size of four Asphalt slate shingles joined together. Notches are cut five inches deep, to be laid five inches to the weather. Slab slates come in the same colors as shingles. One square consists of 90 strips, packed in two bundles and is enough to cover 100 square feet of roof.



BRANTFORD CRYSTAL ROOFING.

The same roofing as Brantford Asphalt Slates and Brantford Asphalt Slab Slates put up in rolls 32 inches wide, weighing 80 pounds. Laid in the same manner as other styles of the Brantford Roofing with a three inch lap and may be used for siding a building.

Write for samples of Brantford Asphalt Roofing products, and for prices and catalogues. The company will furnish estimates on Brantford Specification Work.

CANADIAN ROOFING MFG. COMPANY, LIMITED
WINDSOR, ONT.



PRODUCT.

WINTHROP TAPERED ASPHALT SHINGLES.

SPECIFICATIONS.

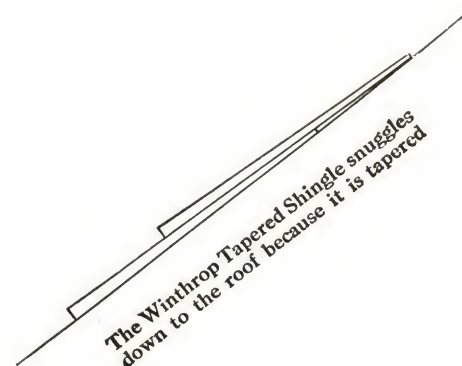
Size 8 inches x $12\frac{3}{4}$ inches, and tapered in thickness heavy at the butt or exposed end. The exposed wearing surface is two and one-third times as heavy and several times thicker than that of the ordinary Asphalt Shingle.

Composed of extra heavy felt, asphalt coated on both sides. Heavily surfaced with natural non-fading crushed slate. Made in two colors, red or green.

SPECIFICATIONS FOR LAYING.

Can be laid as easily as any asphalt shingle. Lay 5 inches to the weather, spaced $\frac{1}{2}$ inch apart. Lay the sheathing close, have boards of uniform thickness and not more than 8 inches in width. Nail each shingle with two galvanized roofing nails. Drive nails 1 inch from each edge and $5\frac{1}{2}$ inches from the butt. Nails should be not less than 1 inch in length.

Can be laid directly over old wooden shingles without removing latter. For this work nails not less than $1\frac{1}{2}$ inches in length shall be used.



ADVANTAGES. Tapered—The Winthrop Tapered Asphalt Shingle is the only tapered asphalt shingle. Because of the taper they snuggle to the roof.

Durable—The first Winthrop Tapered Asphalt Shingles laid some fifteen years ago are still in excellent condition. We don't know how long they will last.

Fire-resisting—Coated with slate, afford complete protection against the flying brand hazard. Exert a very decided blanketing influence on fires inside the building.

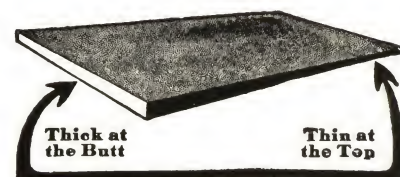
Appearance—The pleasing tones of red and green blend with any surroundings. The big butt affords the distinctive shadow line, adding beauty to the building.

Flexibility—They can be curved to suit architectural designs.

Uniform size—Like brick, they all come the same size. Easily laid, which saves time on the roof.

Adhesive—Processed on their under side, they cannot curl.

Economy—Lowest cost per square per year of service.



COUNTER-WALL.

The perfect insulation. A scientific sheathing made from felt. Made for interior use to withstand heat, cold and dampness. The asphalts contained in it are scientifically blended for this purpose and are so incorporated in the fine rag felt base as to make Counterwall the greatest sheathing of the day. *Made from felt, not paper.*

CAROMCO METHOD FOR BUILT-UP ROOFS.

Embodies all that is best in the construction of built-up roofs. These specifications are the outcome of years of experience in the roofing field. Adaptable to all types of roof decks. Suitable for use on flat or steep inclines. Can be laid with or without gravel surfacing. Specifications on request.

ASBESTOS MANUFACTURING COMPANY, LIMITED

708-9 Drummond Bldg.
MONTREAL

17 St. James St.
QUÉBEC

GENERAL OFFICES AND FACTORY:

LACHINE, QUE.
Near MONTREAL.

411 C.P.R. Bldg.
TORONTO

P.O. Box 836, 49 Pitt St. West,
HALIFAX WINDSOR

PRODUCTS.

EVERYTHING IN ASBESTOS. "ASBESTOSLATE" FOR THE ROOF, "LINABESTOS" FOR THE INTERIOR, ASBESTOS BUILDING LUMBER FOR THE EXTERIOR.

ASBESTOS CEMENT PRODUCTS; ASBESTOS PIPE AND BOILER COVERINGS; ASBESTOS TEXTILES, CLOTHS, TAPES, YARNS; ASBESTOS PAPER AND MILLBOARD; ASBESTOS SHEET PACKINGS; ASBESTOS THEATRE CURTAINS.

"ASBESTOSLATE" (ASBESTOS CEMENT SHINGLES.) Composed of Portland Cement, reinforced with Asbestos Fibres, manufactured under enormous hydraulic pressure, providing a roofing tile that is *Fireproof* and *Permanent*, weighing only $2\frac{1}{2}$ lbs. to the square foot, including lap.

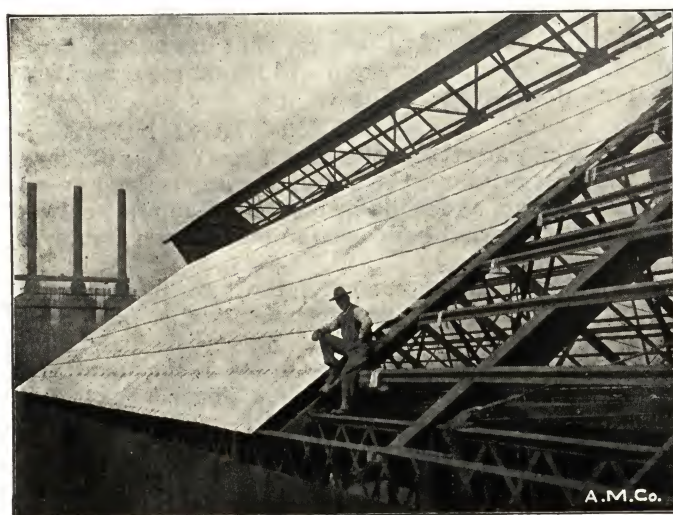
Colours.—Newport Gray, Indian Red, Blue-black and Brown.
Size ($\frac{5}{32}$ " thick).—Practically any size or shape up to 16" x 16", though the following are generally used:

"American" or Slate Method—16" x 16", 8" x 16", 6" x 12". Applied with two galvanised nails in the same manner as slate or shingles. See illustration below.

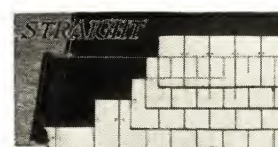
"French" or Diagonal Method and Honeycomb Method—16" x 16", 12" x 12". Applied with one copper and two galvanised nails. See illustration below. See our catalogue for complete specifications.

ASBESTOS CORRUGATED SHEATHING. FROM 30" TO 36"

Same composition as "Asbestoslate." Solid concrete. No metal used. $\frac{3}{16}$ " thick, in lengths up to 10 ft. For roofing and siding in a manner similar to Corrugated Iron. It has been found especially adaptable for gas houses and chemical plants, where other materials fail on account of fumes and gases. May be laid over steel or wood framework, purlin spacing to be from 30" to 36". See our Asbestos Corrugated Sheathing Catalogue for detailed specifications.



ILLUSTRATING METHOD OF APPLYING ASBESTOS CORRUGATED SHEATHING ON STEEL PURLINES



ILLUSTRATING THREE MOST POPULAR METHODS OF APPLYING "ASBESTOS SLATE"

"LINABESTOS" FIREPROOF WALLBOARD.

Manufactured of Asbestos Fibre and Portland Cement. In sheets $\frac{3}{16}$ " thick—48" x 48" and 48" x 96", also 42" x 48" and 42" x 96". Linabestos may be applied with ordinary nails as are other wallboards. We can supply battens of Linabestos any width or wooden battens may be used. Linabestos Filler may be used to fill joints where panelled effect is undesirable. Linabestos has all the good points, lightness, convenience in installation, attractive appearance, economy of ordinary wallboards, and, in addition, gives the greatest possible protection from fire. Linabestos has a colour all its own, a soft salmon pink, particularly suitable for panelling, which harmonizes with most natural woods, so that in many instances no further decoration such as paint or paper is needed, the natural colour, surface and finish being very pleasing. We have supplied enormous quantities for hospitals, churches, schools, residences, factories, etc., etc.

ASBESTOS BUILDING LUMBER.

Portland Cement and Asbestos Fibre. In flat sheets from $\frac{1}{8}$ " to $\frac{5}{8}$ " thick—42" x 48", 42" x 96", 48" x 48" and 48" x 96". For sheathing exteriors of buildings, more especially residences, in place of stucco, to obtain the English half-timber effect. Will not crack and fall away as will stucco. Also used extensively in the electrical industry.

NOTE.

Our Asbestos-Cement products provide *Permanent, Fireproof Roofs and Walls, both interior and exterior, that do not require paint or treatment to keep them in condition. This should appeal to clients who are interested in upkeep costs. We suggest that plans be sent us so that estimates can be given for comparisons with other materials.*

STOCKS.

Carried by agencies throughout Canada.



THE BARRETT COMPANY, LIMITED

MONTREAL TORONTO WINNIPEG VANCOUVER ST. JOHN, N.B. HALIFAX, N.S.

MANUFACTURERS OF COAL-TAR PRODUCTS FOR ROOFING, WATERPROOFING, DAMPPROOFING AND PAVING; ALSO MINERAL SURFACED ROOFINGS AND SHINGLES; SHEATHING AND INSULATING PAPERS.

PRODUCTS.

ROOFING.



A Barrett Specification Roof consists of alternating layers of Specification Felt and Specification Pitch, with a top surface of either gravel, slag or tile. Built-up roofs of tarred felt and coal-tar pitch laid along the lines of the Barrett Specification cover many of the first-class buildings of the Dominion, and back of these roofs stands the Barrett Company, Ltd., with its seventy-five years of experience in the roofing field. Back of these roofs also stands the confidence and knowledge—gained through experience—that this type of roof is the most satisfactory, the most durable and the most economical that it is possible to construct on flat or nearly flat surfaces.

Any Barrett Specification Roof of 50 squares or larger, in towns of 25,000 or more, and in such other places as our inspection service is available, will be guaranteed against repair expense by a Surety Company's Bond. This Bond, issued by the United States Fidelity & Guaranty Co. with headquarters at Montreal, runs for twenty or ten years, depending upon the type of roof, and it is issued without cost to the owner.

Our only conditions are that the Barrett Specification, revised April 15, 1920, shall be strictly followed and that the roofing contractor shall be approved by us and his work subject to our inspection.

A great many of the Dominion's new buildings are covered with Barrett Specification Roofs, for the property-owners and architects of Canada are strong believers in these famous roofs backed with a Surety Bond.

The Barrett Company, Limited, is the only Company that has enough confidence in its roof to put back of it a Surety Bond. In fact, no other concern will guarantee a roof for so long a period, much less furnish a Surety Bond.

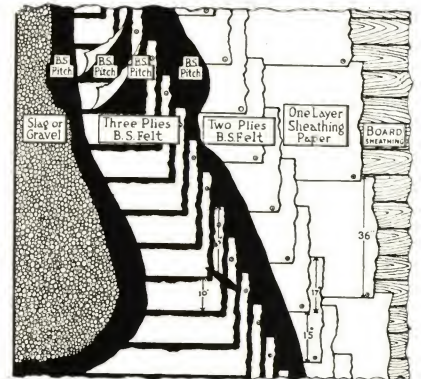
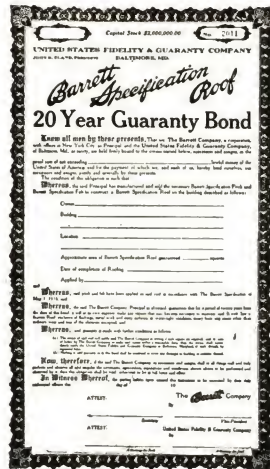


DIAGRAM SHOWING BARRETT SPECIFICATION TYPE "AA" ROOF OVER BOARDS. BONDED FOR 20 YEARS.

GUARANTY.



EVERLASTIC MULTI-SHINGLES. (4 Shingles in one.)

EVERLASTIC "RUBBER" ROOFING

PANAMOID "RUBBER" ROOFING

WATER-PROOFING.

CARBOSOTA CREOSOTE OIL.

VELVEX SHINGLE STAINS.



IMPORTANT NOTICE.

The Barrett Specification Type "AA" 20-Year Bonded Roof represents the most permanent roof covering it is possible to construct on flat or nearly flat surfaces, and while we bond it for 20 years only, we can name many roofs of this type that have been in service over forty years and are still in good condition.

Where the character of the building does not justify a roof of such extreme durability, we recommend the Barrett Specification Type "A" Roof, bonded for 10 years. Both roofs are built of the same high-grade materials, the only difference being in the quantity used.

Full details regarding these Bonded Roofs and copies of the Barrett Specification sent free on request.

Barrett Everlastic Multi-Shingles (4 Shingles in one) are surfaced a crushed mineral in natural shades of red or green. They furnish color and texture to the roof and at the same time give it great durability, exceptional fire-resistance and freedom from painting. No artificial coloring is used. Each strip of Everlastic Multi-Shingles is 32 1/4 inches long by 10 inches high. The self-spacing cut-outs are 8 inches apart and 4 inches deep by 1/2 inch wide.

A recognized standard among "rubber" roofings. Famous for its durability. Made of high grade waterproofing materials, it defies wind and weather and insures dry, comfortable buildings under all weather conditions. Put up in rolls, light, medium, and heavy weights, 36 inches wide, containing 108 square feet. Nails and cement for laying in each roll.

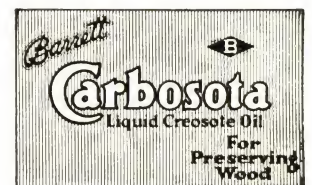
A durable roll roofing, for all steep-roofed buildings. Has a good felt-base, thoroughly waterproofed and coated with sand on one side. This sanded wearing-surface adds durability and increases fire resistance. Comes in rolls, light, medium and heavy weights, 36 inches wide, containing 108 square feet. Nails and cement in each roll.

There is always one sure way of making foundations, reservoirs, swimming-pools, subways, tunnels, etc., permanently watertight, and that is by the membrane method—the use of Barrett Specification Felt and Pitch. When writing for special waterproofing specifications, outline your problem.

A standardized, pure coal-tar distillate, from which all the objectionable properties of crude creosote oil have been completely eliminated. Barrett Carbosota Liquid Creosote Oil is superior to the patented or proprietary wood-preserved, because it is purely a refined coal-tar creosote.

It is extensively used by railroads, contractors, telegraph and telephone companies.

The ideal colorings and preservative for shingles and all rough, unplanned timber. Cheaper than paint and easier to use. The creosote penetrates and preserves the wood. All colors in soft velvety tones. Color samples on request.





CANADIAN JOHNS-MANVILLE CO., LIMITED

MINERS OF ASBESTOS,

MANUFACTURERS OF ASBESTOS AND ALLIED PRODUCTS.



HAMILTON, MONTREAL, OTTAWA, TORONTO, VANCOUVER, WINNIPEG, WINDSOR.

PRODUCTS.

ASBESTOS SHINGLES; ASBESTOS ROOFINGS, READY-TO-LAY, BUILT-UP AND CORRUGATED; KEYSTONE HAIR INSULATOR; ACOUSTICAL CORRECTION; PIPE AND BOILER INSULATION; UNDERGROUND SYSTEM OF PIPE INSULATION; RADIATOR AND STEAM TRAPS; INDUSTRIAL FLOORING; PACKINGS; REFRACTORY CEMENTS; ELECTRICAL MATERIALS; TRANSITE AND EBONY ASBESTOS WOOD. Also RAG FELT READY-TO-LAY ROOFING AND WATERPROOFING MATERIALS.

SERVICE.

Johns-Manville products are backed by the responsibility of the Johns-Manville Organization. This assures the best of service, value and satisfaction.

Full details, specifications and drawings will be gladly furnished by the engineering service department of the nearest branch office.

JOHNS-MANVILLE STANDARD AND COLORBLENDE ASBESTOS SHINGLES.

Made of asbestos fibre and Portland cement, united under hydraulic pressure. Strong, tough, resilient, fire-proof, waterproof, light, easy to lay. Will not rot, curl or split. Furnished in various sizes and shapes, in four colors and two thicknesses— $\frac{1}{4}$ " and $\frac{1}{8}$ ".

Approved by Underwriters' Laboratories, Inc., and take base rates of insurance.

JOHNS-MANVILLE FLEXSTONE ASBESTOS SHINGLES.

Made of asphalt impregnated asbestos felt with a surfacing of crushed red or green slate in two forms; individual rectangular shingles, 8" x 12 $\frac{3}{4}$ " and strip shingles, four shingles to the strip, 32" x 10". Approved by Underwriters' Laboratories, Inc., in class B, and take base rates of Insurance.

JOHNS-MANVILLE ROOFINGS.

Ready-to-lay Roofings for sloping roofs. Made of sheets of asbestos felt, waterproofed and cemented together with asphalt. Furnished in different styles: Red top, with surfacing of crushed red slate on one side; Green top, with surfacing of crushed green slate on one side; Medium, plain black, smooth surface both sides, made of two layers of asbestos; Heavy, plain black, smooth surface both sides or White wearing surface if desired, made of three layers of asbestos; furnished in sheets and rolls, ready to lay; Extra Heavy, plain black, smooth surface, both sides or White Top, made of four layers of asbestos; furnished in sheets only.

Built-up Roofing for flat or pitched roofs. Layers of asbestos felt, impregnated with asphalt, built up on the roof deck, to the required thickness, by Johns-Manville workmen, or approved roofing contractors.

Corrugated Asbestos Roofing and Siding for skeleton frame buildings. In two forms; one made of asbestos fibres and Portland cement moulded under hydraulic pressure into dense, structurally strong sheets $\frac{1}{4}$ " thick, 42" wide by 96" long. The other form is made of asphalt impregnated asbestos felts with a reinforcing center sheet of metal in sheets 6, 7, 8, 9, 10, 11 and 12 ft. long by 28" wide.

Johns-Manville roofings are approved by Underwriters' Laboratories, Inc., and take base rates of insurance.

JOHNS-MANVILLE KEYSTONE HAIR INSULATOR.

Made of cleansed and sterilized cattle hair, secured between sheets of asbestos or building paper. Produces an effective insulating or sound deadening barrier in walls, floors, ceilings, partitions, etc.; is proof against rot, moisture and vermin; slow burning; and will not settle, dry out or split.

JOHNS-MANVILLE ACOUSTICAL CORRECTION SERVICE.

Correction of reverberation or echoes in buildings requires the technical skill of an expert. The services of competent Johns-Manville acoustical engineers are available to architects and others who have difficulties to overcome either in designing new buildings or in correcting existing ones.

JOHNS-MANVILLE PIPE AND BOILER INSULATION.

Twenty-six years' specialization, directed by the highest engineering talent, has enabled Johns-Manville to develop and produce insulations of exceptional efficiency and durability under every service condition.

Asbesto-Sponge Felted, for example—a remarkable material which combines the insulating value of sponge with the endurance of asbestos—ranks first in efficiency among commercial steam pipe insulations. In addition, there are Improved 85% Magnesite, improved Asbestocel, Zero, Anti-Sweat, and Brine and Ammonia Insulations.

JOHNS-MANVILLE UNDERGROUND SYSTEM OF PIPE INSULATION.

Provides a permanent, efficient and economical means of insulating underground pipes conveying steam or hot water. Its efficiency is guaranteed.

JOHNS-MANVILLE RADIATOR AND STEAM TRAPS.

These devices permit the free discharge of water and air from any radiator or other steam apparatus without loss of steam. There is just one moving part—a ball, which rises when water flows into the trap and uncovers the outlet, but when there is no water to discharge, the ball is held against the outlet by unbalanced pressure.

The operation of these traps is continuous, for the water is discharged as soon as it is received. There are sizes for every type of apparatus.

JOHNS-MANVILLE INDUSTRIAL FLOORING.

An asphaltic concrete that can be laid in any consistency between extreme hardness and softness. Damp-proof, easy to walk on and very durable under hard usage in factories, warehouses, machine-shops, creameries, etc. It is made to fit each individual installation under separate specification.

JOHNS-MANVILLE PACKINGS.

Provide for economy by preventing leakage and reducing friction. Engineers have found that instead of having to repack several times a season, a set of Johns-Manville Sea Rings often lasts several seasons, because heavy wear on packings, wear of the rod, and loss of power through friction have been reduced to the minimum.

Other Johns-Manville Packings are: Universal Piston Packing, Service Sheet, Seigelite Sheet, Kearsarge Gaskets, Vulcabeston Pump Valves, Mogul Coil Packing, etc.

JOHNS-MANVILLE REFRACTORY CEMENTS.

Composed of highly refractory minerals, specially adapted for use as a bond between, or a coating for fire bricks. Withstand the action of flame and severe temperatures.

Used in place of fire-clay and other mixtures to increase the life of boiler and other fire-brick settings.

JOHNS-MANVILLE ELECTRICAL MATERIALS.

The "Noark" line of Electrical Protective Devices comprises Cartridge Enclosed Fuses—Renewable and Non-Renewable—Cutout Bases—Main Line and Branch—Fuse and Switch Boxes, Primary Distribution Fuse Boxes, Underground Junction and Distribution Boxes, Service Meter Protective Devices, Exteriorly Operated Switch Boxes, Allsafe Switches, Friction Tape and a complete line of accessories.

JOHNS-MANVILLE TRANSITE AND EBONY ASBESTOS WOOD.

A fire-proof building material made of asbestos fibre and Portland cement. For use as a fire barrier in factories, foundries, warehouses, machine shops or wherever a fire-proof building material is required. It is strong, comparatively light and very durable. On electrical work it is used for transformer room doors, bus enclosures, and many other places where fire-proof qualities and physical strength are necessary.

The impregnated form, Ebony Asbestos Wood, is the strongest insulating base that can be used for switchboards. It resembles the best oiled slate, but is much stronger physically and dielectrically.



YOU CAN'T EXPECT BEAVER
QUALITY RESULTS UNLESS
THIS TRADE-MARK IS ON
THE ROOFING YOU BUY.

THE BEAVER COMPANY, LTD.

MANUFACTURERS OF

VULCANITE ASPHALT SHINGLES AND ROLL ROOFINGS, BEAVER
BOARD AND BEAVER BLACKBOARD.

(See also page 67).

ADMINISTRATION OFFICES:

THOROLD, ONT., CANADA.

BUFFALO, N.Y., U.S.A.

LONDON, ENGLAND.

TIMBER OPERATIONS AT FREDERICKHOUSE AND CHARLTON, ONT.

MILLS AND PLANTS AT THOROLD AND OTTAWA, ONT.

EASTERN SALES OFFICE:

THOROLD, ONT.

WESTERN SALES OFFICE:

WINNIPEG, MAN.

Distributors and Dealers Everywhere.

THE COMPANY.

Vulcanite Roofing was first manufactured in Great Britain about fifty years ago. The first Vulcanite plant in North America was opened at Chicago in 1902, since which time Vulcanite has built up the largest roof manufacturing facilities on the continent. The Canadian plant at Ottawa, Ontario, is thoroughly equipped to manufacture the highest quality roofings.

Vulcanite roofings are built up with a tough, fibrous felt base saturated and coated with Vulcanite specification asphalt. The Beaver laboratories, by systematic inspections and tests, constantly guard each step in its production and thus insure uniformly high quality in the finished product.

VULCANITE QUALITIES.

Vulcanite roofing gives complete weather protection. It is absolutely weather proof, it can't rot, it can't rust, alternate freezing and thawing can't make it disintegrate.

Vulcanite is fire-resisting. Sparks or burning brands falling on Vulcanite Roofs simply die out. Intense heat will not cause the roof to crack or buckle. And fires started beneath Vulcanite Roofs are more easily quenched because flames find it hard to break through this protective covering.

Vulcanite is durable. Roofs laid nearly twenty years ago are still in perfect condition, and the Vulcanite Roofing manufactured to-day is a greatly superior product.

A COMPLETE LINE.

Besides the shingles illustrated and described at the right the complete Vulcanite line includes roll roofings for every purpose. Vulcanite roll roofings are 32" wide and each roll contains sufficient material with accessories to cover 100 square feet of roof surface, allowing for all necessary laps and seams.

Vulcanite Slate-surfaced roll roofing is illustrated at the right. The other Vulcanite roll roofings are as follows:

VULCANITE ASPHALT. Built up on a strong felt base thoroughly saturated and coated with Vulcanite Specification Asphalt. A surfacing of fine silica sand is firmly imbedded in both surfaces, increasing the weather and fire-resisting qualities of the roofing. Made in three weights: Medium, 65 lbs. per square; Heavy, 75 lbs. per square; and Extra Heavy, 90 lbs. per square.

VULCANITE HIGRADE. Surfaced on both sides with non-absorbent, non-conducting flaked mica, which adds to its fire and weather-resisting qualities and at the same time gives HIGRADE a distinctive, pleasing appearance on the roof. Three weights: Light, 35 lbs. per square; Medium, 45 lbs. per square; and Heavy, 55 lbs. per square.

ALLIGATOR. The ideal inexpensive roofing. Talc finish. Derives its name from the pleasing leathery texture of the asphalt coating. Made in three weights: Light, 35 lbs. per square; Medium, 45 lbs. per square; and Heavy, 55 lbs. per square.

SAMPLES.

Samples of Vulcanite Roofing and detailed information will be forwarded free of charge. Address your request to the Thorold or Winnipeg sales office.

SELF-SPACING SHINGLES.

An exclusive improvement over ordinary straight-edge shingles — automatic spacing saves time. Builds a perfectly sealed roof with double thickness throughout. Size 8" x 12 1/4". Packed 4 bundles to the square. Standard weight, 240 lbs. per square. Surfaced with natural colored crushed slate, red and green.



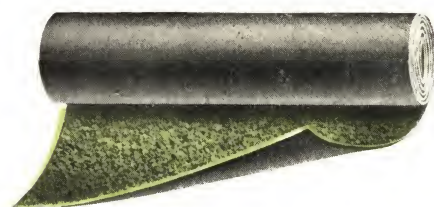
HEXAGON SLAB SHINGLE.

A distinctive Vulcanite design having unusual decorative possibilities. Patented design insures correct spacing and quick application. Gives double thickness over entire roof area. Surfaced with crushed slate in cool sage green or deep indian red. Double butt gives heavy tile effect. Size over all 32" x 12 1/2". Weight 200 lbs. per square.



4-IN-1 SLAB SHINGLE.

A slab-type shingle which produces an attractive individual shingle effect. Quick and easy to lay with four shingles spaced automatically in each slab. Size over all 32" x 10". Weight 190 lbs. per square.



SLATE SURFACED ROLL ROOFING.

The highest type of "Beaver Quality" roll roofing. Manufactured from the best grade of fabric felt, saturated and coated with Vulcanite specification asphalt and surfaced with natural colored crushed slate, red or green. Standard weight, 80 to 85 lbs. per square; Jumbo weight, 105 lbs. per square.

THE ARGUS MANUFACTURING COMPANY

PLASTIC ROOFING AND LIQUID ROOF COATINGS.

TECHNICAL PAINTS, ASPHALT SPECIALTIES, DAMPPROOFINGS, PRESERVATIVES.

TORONTO, CANADA.

311 KING STREET EAST

WAREHOUSES: MONTREAL, WINNIPEG.

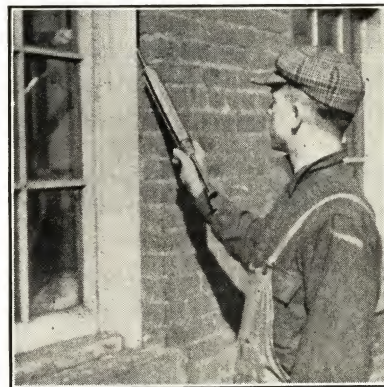


USES.

Window and door frames (of brick buildings especially) rarely fit snug and *never* airtight. Buildings vibrate and settle. Frames no longer set flush with the masonry. Unsightly openings appear, admitting draughts, dust and soot, dampness and water, causing ruination of the finish around the inside of window and door frames, to say nothing of the heat wasted.

Here is a statement from an expert who knows: "With a building uncaulked, a wind blowing thirty miles an hour forces through *one average size window frame*, 109.98 cubic feet of air *per minute*, on the windy side, no matter how tightly the window is closed."

Count your windows and doors and figure it out for yourself. How much heat do you waste in winter when cold air is coming in around every window and door frame at that rate, and your heat going out on the other side? Are you wasting 20%, 30% or 50% of your fuel? Ventilators and windows should be your control of temperature. *Cracks around door and window frames rob you of this control.* These cracks are admitting cold air into your building twenty-four hours every day. ARGUS-CAULK *will kill this waste for you.*



CAULKING AROUND WINDOW FRAMES.

UNIQUE QUALITIES.

Argus-Caulk has several unique qualities. First, it never dries brittle hard. The sun can beat on it for weeks—it never dries. Below zero temperature cannot crack it. This we guarantee. When Argus-Caulk sets, a film or skin forms on its surface. This prevents the material beneath it from *ever* drying. As a matter of fact, years after application this skin has been broken only to find the material beneath to be in a plastic, spongy and "fresh" condition. Argus-Caulk *never dies*—its life is permanent—it lives to serve you year after year.

PRODUCTS.

ARGUS-CAULK, ARGUS ROOFCOAT, ARGUS ROOF CEMENT, ARGUS FLEX, ARGUS BOILER COAT, TECHNICAL PAINTS, ASPHALT SPECIALTIES, DAMPPROOFINGS, FUEL SAVERS, PRESERVATIVES.

AT YOUR SERVICE.

We maintain a Service Department for you and we hope you will use it. We are proud to say that some of the largest corporations both in Canada and the United States together with scores of smaller ones are taking our advice in regard to the preservation of their exterior surfaces. We manufacture plastic and liquid asbestos roof coatings, caulking and glazing compounds, technical paints for special purposes, also dampproofings and boiler setting covering. When you are interested, write us, as we are always ready and willing to furnish all information desired.

EXTRACTS FROM OUR SATISFACTION LIST.

Armstrong, Smyth & Dowswell Ltd.	Regina, Sask.	Montreal Harbor Commissioners	Montreal, Que.
Bingham & Bingham	Winnipeg, Man.	Montreal Locomotive Works	Montreal, Que.
Cameron & Heap Ltd.	Regina, Sask.	Penmans Ltd.	Paris, Ont.
Canadian Consolidated Rubber Co.	Montreal, Que.	James Robertson Co. Ltd.	Montreal, Que.
Canadian Locomotive Co. Ltd.	Kingston, Ont.	Robertson Bros. Ltd.	Toronto, Ont.
Canadian National Railways	Joliette, Que.	J. Robinson & Co. Ltd.	Winnipeg, Man.
Canadian Pacific Railways	Montreal, Que.	City of Saskatoon	Saskatoon, Sask.
Wm. Davies Co. Ltd.	Montreal, Que.	Standard Chemical Co. Ltd.	Fassett, Que.
Wm. Davies Co. Ltd.	Toronto, Ont.	City of Toronto	Toronto, Ont.
T. Eaton Co.	Winnipeg, Man.	City of Winnipeg	Winnipeg, Man.
Grand Trunk Railway System	Montreal, Que.	Winnipeg Electric Railway	Winnipeg, Man.



THE ARCO COMPANY LIMITED

PAINTS AND PRESERVATIVES
ROOFING AND CAULKING COMPOUNDS

FACTORY AND HEAD OFFICE—TORONTO, ONT. WAREHOUSES—WINNIPEG AND VANCOUVER

COMPANY POLICY.

The Arco policy is simply stated: to buy the best raw material, to maintain the latest laboratory and factory equipment, and to employ well paid loyal workers, all for the single purpose of producing at a fair price materials of indisputably high quality.

ARCO TOP

A heavy liquid material for waterproofing almost any kind of roofing; quickly and easily applied by a brush; one coat; a fire retardant; renews, preserves, waterproofs; has durable weather-resisting properties. Apply one gallon to 100 square feet on metal, felt, rubberoid, and three gallons to gravel. For very dry and porous surfaces prime first with Arco primer.

ARCO SEALIT.

A plastic material for filling cracks, seams, flashings, holes wherever they occur on roofs, wood or concrete tanks, gutters, fluming, etc; applied with a trowel by any unskilled labour. 40 pounds to 100 square feet. Should always be on hand for the quick and inexpensive stopping of leaks.

ARCO 834.

A special product for use in the Arco gun (the latest and most approved caulking machine) for pointing bricks, caulking cracks or seams in walls or ceiling, stopping cracks between window frames and walls, and for making buildings tight, draft proof and weather proof. Arco 834 is a heat saver and a preserver of interior decoration; it keeps out dust, soot and smoke. Arco 834 will increase your comfort, preserve your building and interior decoration and will reduce your heating cost.

ARCO 835.

Similar to Arco 834, but produced in several colours, especially for caulking and glazing of glass houses, conservatories, etc. It is quickly applied with the Arco Gun, requires much less than ordinary putty, will not crack and has an infinitely longer life than the best knife grade putty.

SEAL A SET.

A special compounded material for application to boiler settings to check the infiltration of air and the consequent serious fuel losses. A conservative estimate of saving in fuel is from five to ten per cent., so that in many cases the saving in one month is sufficient to pay for the application. Apply from 40 to 50 pounds to 100 square feet.

ARCOTUM.

A paint for barns, bridges, fences, implements, metal roofs; one that will wear and look well; made in the colour you require and made for the hardest outside work.

In addition to the above specialties the Arco House Paints, Mill Whites, Varnishes, etc., are ready to serve you, and our representatives are at your service from coast to coast. A letter to us will place our representative at your side on short notice.



CAULKING WINDOW CASEMENTS
WITH ARCO GUN



H.C. McLEAN BUILDING, ADELAIDE ST. TORONTO.
CAULKED WITH ARCO 834.

JUSTICE

CO-OPERATION

ECONOMY

ENERGY

SERVICE



THE PEDLAR PEOPLE LIMITED

OSHAWA, ONTARIO, CANADA.



MAKERS OF FORMED
PRODUCTS OF



THE IRON THAT
ENDURES AND INSURES

ADDRESS NEAREST BRANCH.

MONTREAL, 26 Nazareth St.	OTTAWA, Banque Nationale Bldg.	TORONTO, 473 College St.	HAMILTON, Clyde Block, King & Hughson Sts.	WINNIPEG, 80 Lombard St.	VANCOUVER 318 Homer St.
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UNITED ALLOY STEEL CORPORATION, CANTON, OHIO, SOLE PRODUCERS, TONCAN METAL.

TONCAN METAL IS GALVANIZED IN CANADA BY DOMINION SHEET METAL CORPORATION, LIMITED, HAMILTON.

DESCRIPTION.

Toncan Metal is a rust and corrosion-resisting sheet metal, made from an iron ore base and procurable in galvanized, blue annealed, black and painted finishes. Our Betty Sheet Metal Book gives complete details and evidence.

ADVANTAGES.

In Toncan Metal lies the most satisfactory solution of the Sheet Metal problem. It enables you to specify a moderate priced sheet metal of unquestioned durability—a durability proven by many years of use in thousands of structures and in every form of severe sheet metal service.

USES.

Toncan Metal Roofing, Siding, Ventilators, Skylights, Window Frames, Cornice, Conductor Pipe, Eaves Trough, Blower Systems, Tanks, Refrigerators, Reinforcing and Metal Lath are some of the uses for Toncan Metal in building construction.

ROOFING.

There are Toncan Metal Corrugated, V-Crimped, Pressed Standing Seam and Roll Roofing. Also Toncan Metal Shingles and Spanish Tile.

SIDING.

Toncan Metal Siding is made in the following styles: Weatherboard, Pressed Brick, Rock Faced Brick, Rock Faced Stone and Corrugated.

EAVES TROUGH, CONDUCTOR PIPE, Etc.

Toncan Metal is made up into the usual standard forms of eaves trough and conductor pipe, i.e.: Plain Round, Corrugated Round and Square Conductor Pipe; Single or Double Bead Eaves Trough, lap or slip joint.

METAL LATH.

For the more trying forms of metal lath service—near the sea or in walls subject to continuous dampness—Toncan Metal should always be specified for the lath, and many builders prefer to have the extra assurance of durability that comes from the use of Toncan for all Metal Lath work.

SPECIFICATIONS.

Toncan Metal meets all the requirements of modern sheet metal practice. To secure it simply specify "Genuine Toncan Metal" for the sheet metal work or products.

IDENTIFICATION.

All genuine Toncan Metal Sheets bear the following trade mark.



INSTALLATIONS.

Following are a few of the many structures in which Toncan Metal has been or is being used: New King Edward Hotel, Toronto; Chateau Frontenac, Quebec; Customs Building, Royal Mint and East Block of Parliament Building, Ottawa; Plant of J. R. Eaton & Sons, Ltd., Orillia, Ont.; Warehouse of Wood, Alexander & James, Hamilton, Ont.; Royal Observatory, Victoria, B.C.

See also our advertisement on pages 14-16 and 66.



CORRUGATED ROOFING AND SIDING.
(This is only one of many styles.)



TONCAN METAL ROLL ROOFING.
(Another form of Toncan Metal Roofing.)



CONDUCTOR PIPE.



EAVES TROUGH.



TONCAN METAL LATH.



V.M.C.A. BLDG., TORONTO. BURKE, HORWOOD & WHITE, Architects.
Toncan Metal Lath Used.

DOMINION SHEET METAL CORPORATION, LIMITED.

HAMILTON, ONT.

THE OLDEST MANUFACTURERS OF GALVANIZED SHEETS IN CANADA

CAPACITY 25,000 TONS A YEAR



GALVANIZED
STEEL
SHEETS

Galvanized in the most modern plant in the world—located at Hamilton, Ontario. The base sheet is especially selected for toughness, strength and general working-up quality, rolled true to gauge, smooth and flat. We apply a uniformly heavy coating of virgin metals, our spelter being made by electrolytic process in British Columbia. Being pure it gives a more uniform extra-adhesive coating. Every sheet guaranteed perfect.



THE "BETTER
IRON" SHEETS

A pure iron sheet, with a metallic purity of 99.75 plus copper content .20%. Used throughout Canada since 1912 by railways, governments, manufacturers—the most durable sheet made; for use where corrosion attacks. The merit of Pure Iron Sheets for corrosion resistance has been established by 15 years of actual service. To this proven merit we add copper as an alloy, the result being an unbeatable extra durable combination of virtues. Galvanized in our own plant with an extra heavy pure coating. Every sheet stencilled with the name "Toncan Metal." Sells at a small advance over steel sheets. Toncan Metal insures and endures.



WEIGHTS PER
SQUARE FOOT

These weights per square foot apply to both "Premier" Steel and "Toncan Metal" Better Iron Galvanized Sheets:—

GAUGE—	12	14	16	18	20
OZS. PER FT.—	72.5	52.5	42.5	34.5	26.5
LBS. PER FT.	4.531	3.281	2.656	2.156	1.656
GAUGE—	22	24	26	28	10 $\frac{3}{4}$ OZ.
OZS. PER FT.—	22.5	18.5	14.5	12.5	10.75
LBS. PER FT.	1.406	1.156	.906	.781	.672

GAUGES AND
SIZES.

No. 12 to No. 20—up to 44" x 132" maximum
No. 22 to No. 24—up to 42" x 132" maximum
No. 26 to 10 $\frac{3}{4}$ oz.—up to 36" x 120" maximum
Stock widths—24", 30", 36"
Stock lengths—60", 72", 84", 96", 120"

RECOMMENDED
SPECIFICATION
WHERE
DURABILITY
ESSENTIAL.

All galvanized iron work shall be "Toncan Metal" Sheets, every sheet stencilled with brand. Gauge to conform to weight per square foot shown in table above—The sheets shall have a metallic purity of 99.75% plus copper content .20%. Coating of virgin metals to be not less than 1.50 ounces per square foot of surface. No sheets accepted which do not fully conform. Gauges to conform to general specifications in this book under "Flashings and Sheet Metal Work."

JOHN LYSAGHT, LIMITED

MANUFACTURERS,
BRISTOL, ENGLAND.

A. C. LESLIE & CO., LIMITED

MONTREAL, QUE.

MANAGERS, CANADIAN BRANCH.

BRANCH OFFICES: TORONTO AND WINNIPEG

PRODUCTS.

"QUEEN'S HEAD" and other well-known brands of GALVANIZED SHEET IRON.

"QUEEN'S HEAD."

This brand is the standard the world over for high-class work. Made of the best grade of soft Open Hearth Steel, absolutely flat, it will stand the most severe working tests. It differs from all other makes in the system of galvanizing, which gives a smooth, bright surface, free from thinly coated or defective spots, ensuring the greatest durability. While extravagant claims are made for so-called "Rust-Resisting" sheets, the fact is that in actual climatic exposure no black sheet will stand long. The life of a galvanized sheet depends almost entirely on the coating, and the proved superiority of "QUEEN'S HEAD" galvanizing makes it the cheapest sheet for all outside work.



HOW TO SPECIFY.

All Galvanized Iron Work to be of "QUEEN'S HEAD." No other brand will be accepted as "equal." Brand to appear on every sheet.

{ CORNICES—To be made of 28G "Queen's Head" Galvanized Iron.
{ CONDUCTORS—All Conductors to be either Corrugated or made with expansion joints.
{ FLASHINGS—To be of "Queen's Head" Galvanized Iron.

GUTTERS—To be made of 26G "Queen's Head" Galvanized Iron.
All Gutters to be set with an even continuous fall to rain conductors.

{ SKYLIGHTS—To be made of 24G "Queen's Head" Galvanized Iron.
{ VENTILATORS—Skylights to have condensation gutters with discharge at eaves.

No other brand can fairly be substituted for "Queen's Head," for none is equally durable.

WEIGHTS PER SQUARE.

GAUGE.....	28	26	24	22	20	18	16
WEIGHT.....	67.1 lbs.	75.0 lbs.	105.5 lbs.	124.0 lbs.	161.0 lbs.	195.0 lbs.	262.0 lbs.

Lysaght's Sheets are rolled as true to gauge as possible, not varying more than 5% from these average figures. This is important, as light weight sheets are often supplied.

"FLEUR-DE-LIS."

Is made of the same quality of Steel as "Queen's Head" and is fully guaranteed for working purposes. It differs chiefly in the galvanizing, which is somewhat lighter than on "Queen's Head," but as a "tight coat" or "non-peeling" sheet is unequalled and should be specified for work where very sharp bends or close seams are necessary.

CORRUGATED SHEETS.

"Redcliffe" is the standard brand for this purpose, made of soft Steel, uniform in weight, and of exactly the same finish as "Fleur-de-Lis." For special work requiring the most durable galvanizing, "ORB" Brand should be specified.

H. H. ROBERTSON COMPANY, LIMITED

SARNIA, ONTARIO.

GENERAL SALES AGENTS FOR CANADA:

B. & S. H. THOMPSON & CO., LIMITED

MONTREAL

TORONTO

WINNIPEG

NEW GLASGOW, N.S.

VANCOUVER, B.C.

PRODUCTS.

ROBERTSON
PROCESS
METAL.



ROBERTSON PROCESS METAL: FLAT, CORRUGATED AND MANSARD SHEETS AND BARS FOR ROOFING AND SIDING, FLASHING, RIDGE CAPS, LOUVERS, GUTTERS, DOWN-SPOUTS, VENTILATORS AND SKYLIGHTS. Also manufacturers of ROBERTSON PROCESS ASPHALT, SATURATION COMPOUNDS, INSULATION COMPOUNDS, MINERAL RUBBER, BATTERY SEALING COMPOUNDS.

A metal building material which is fully protected from the most severe weather conditions, smoke, gases, fumes, condensation and salt sea air, by means of three impervious coatings: (1) asphalt, (2) asbestos felt, (3) waterproofing. It is made in sheets and bars for use in industrial and commercial buildings on roofing, siding, down-spouts, gutters, general building trim, skylights and ventilators.

Robertson Process Metal represents real building economy from every standpoint. It is moderate in first cost, is easily erected and eliminates the necessity for repairs.

It withstands rust and corrosion and does not need frequent painting. It has all the *light weight, structural steel* and *foundation* cost-saving features of plain or galvanized sheets and at the same time is corrosion-proof. Its light weight insures a substantial reduction in freight charges. A square of R.P.M. weighs, on the average, only 200 lbs. The covering area of a ton of R.P.M. is far greater than any other building material of equal durability. An actual sample of Robertson Process Metal like that illustrated will gladly be sent on request.

FORMS,
COLOR AND
SIZES.

Robertson Process Metal is made in a variety of standard forms and sizes which good practice has demonstrated to be the most useful, economical and attractive. It is made in flat, corrugated and mansard roofing and siding sheets. It is also made in various forms for building purposes, such as ridge-caps, down spouts, gutters, flashing, louvers, etc. Robertson Process Metal forms an important part of Robertson Ventilators and Robertson Skylights.

Robertson Process Metal is supplied in black, red and aluminum finish. Sizes and weights will be given on application. All necessary materials needed in fastening—such as nails, rivets, hooks, straps, bolts, etc., can be supplied.

ADVANTAGES.



ROBERTSON
PROCESS METAL
CORRUGATED
SHEET

Robertson Process Metal has stood every test on buildings in the service of railroads, chemical and fertilizer concerns, coal mines and the iron and steel industry, and is used and endorsed by engineers and architects throughout Canada and the United States. The fact that it is immune to the corroding action of gases, acid and alkali fumes, all weather conditions, and salt sea air, makes it exceptionally well-suited to building construction where protection against severe corrosion conditions is essential. Its low cost per year makes it attractive to all other industries as well.

Robertson Process Metal has insulating qualities that greatly reduce the tendency toward condensation of moisture. Buildings in which it is used are, therefore, drier, easier to heat in winter and remain cooler and more comfortable in summer.

The light weight, strength and permanency of Robertson Process Metal renders construction as a whole less costly by comparison with other building material. Furthermore, first cost is the total cost. There is no upkeep, no repair; *painting* is unnecessary. It saves on *first cost* and *maintenance cost*.

PURLIN AND
GIRT SPACINGS.

For corrugated sheets on roof structures having a rise of 4" or more in 12", purlins may be spaced as follows:

No. 26 gauge for spans up to 3' 9" centers
No. 24 gauge for spans up to 4' 9" centers
No. 22 gauge for spans up to 5' 9" centers

No. 20 gauge for spans up to 6' 6" centers
No. 18 gauge for spans up to 7' 6" centers

Corrugated Robertson Process Metal Sheets for siding, girts may be spaced as follows:

No. 26 gauge for spans up to 3' 10" centers
No. 24 gauge for spans up to 4' 10" centers

No. 22 gauge for spans up to 5' 10" centers
No. 20 gauge for spans up to 6' 8" centers

WEIGHT OF ROBERTSON PROCESS METAL IN POUNDS PER 100 SQUARE FEET OF MATERIAL AREA

Gauge	Corrugated or Mansard				Gauge	Corrugated or Mansard			
	Net Weight		For Crated Shipments Add			Net Weight		For Crated Shipments Add	
	Black	Maroon	Domestic	Export		Black	Maroon	Domestic	Export
26	138	144	14	20	22	192	198	16	22
24	165	171	15	21	20	218	224	17	24

WELL-KNOWN
USERS OF
ROBERTSON
PROCESS
METAL.

This partial list of users is significant because of the prominence of the various corporations and because all of them have used *Robertson Process Metal* repeatedly. The date of the original order is shown after each name. The experience of such concerns, covering many years' usage, is evidence of the true value in this Robertson product.

COMPANY	FIRST ORDER	
American Car & Foundry Co.	1913	7 orders
American Locomotive Co.	1913	13 orders
Bethlehem Steel Co.	1910	24 orders
Crucible Steel Company of America	1913	37 orders
Davison Chemical Co.	1908	70 orders
E. I. du Pont de Nemours & Co., Inc.	1909	29 orders
Eastman Kodak Co.	1919	16 orders

COMPANY	FIRST ORDER	
General Chemical Co.	1909	111 orders
General Electric Co.	1915	8 orders
Hudson Coal Co.	1919	31 orders
Jones & Laughlin Steel Co.	1913	22 orders
Pennsylvania Lines	1909	94 orders
Standard Oil Companies & Subsidiaries	1912	100 orders
United States Steel Corporation	1909	272 orders

CONTINUED ON NEXT PAGE

ROBERTSON VENTILATOR.

This Robertson product is built completely of Robertson Process Metal, and will withstand the most severe gases, fumes, smoke, etc., from the inside and all weather conditions from the outside. It does not need painting or repairs.

In addition to exceptional durability the Robertson Ventilator possesses many superiorities in design and construction. It is a stationary, long barrel type of ventilator, designed to provide the greatest development of air current under all conditions. It does not rely upon mechanical adjustment or moving parts which are not permanently operative. It has no bearings, spiders, braces and other supporting parts to resist the free passage of air.

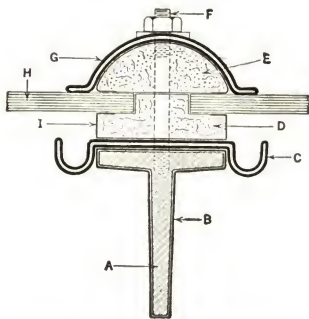
Note in the illustration the projecting wings (an exclusive Robertson feature) which catch the wind and direct it into the double air channels. A ventilator's efficiency is largely determined by its capacity to utilize outside air currents for the purpose of siphonage. No matter whether the wind strikes the Robertson Ventilator from above, below or any angle, the deflecting devices utilize it to produce the suction necessary to draw the air out of the building. The Robertson Ventilator operates at full capacity in a gale of wind or when there is scarcely a breath of air stirring. Furthermore, the Robertson design eliminates all possibility of loss of efficiency through back draft.

Robertson Ventilators are made in a variety of sizes to meet all requirements. Complete details and estimating data sent on request.



ROBERTSON PROCESS
METAL VENTILATOR

ROBERTSON SKYLIGHT CONSTRUCTION.



CROSS SECTION, ROBERTSON
PROCESS METAL SKYLIGHT
CONSTRUCTION

Robertson engineers have developed skylight construction to a point of great efficiency. A glance at the following condensed description shows that provision has been made for the elimination of rust, corrosion, glass breakage through deflection, improper cushioning and separating—everything which might shorten the life and efficiency of skylights.

(A) STANDARD ROLLED TEE, STEEL ANGLE OR CHANNEL BAR BEAM—*Always* initially stiff enough, regardless of span, to carry its load without deflection—which is the main cause of glass breakage.

(B) ROBERTSON PROCESS PROTECTIVE COATING—Proof against acid, alkali, fumes and moisture. Preserves steel beam from corrosion and consequently loss of initial stiffness. Obviates expensive periodical painting.

(C) ROBERTSON PROCESS METAL CONDENSATION GUTTER—Not a part of the beam. Collects condensation from glass. Cannot corrode. In sawtooth and continuous monitor sash, the condensation gutter illustrated C, is usually omitted.

(D) ASPHALTIC GLASS CUSHION AND SEPARATOR—Provides a non-absorbent, resilient, permanent and insulating bed for glass. Positively keeps glass from contact with hard substances, even the bolts, and gives it a broad and continuous bearing; hence preventing destructive strains. It is composed of very high grade asphalt.

(E) ASPHALTIC CAP FILLER—Leaves no hollow spaces. Follows contour of glass surface, and adheres to it, hence absolutely excludes water. Made of same material as the cushion.

(F) CAP BOLT AND NUT—Clamps the glass between flexible cushion and filler, insuring permanently waterproof joints. Supports cleaners' bridge planks without straining glass. Usually made of brass.

(G) ROBERTSON PROCESS METAL CAP—Protects filler and distributes pressure evenly and continuously. Spring tension locks the cap nuts. Of pleasing appearance and does not allow snow and dirt to lodge.

(H) GLASS—As specified.

FINISH—The bar, A, may be merely painted if desired.

BAR LENGTHS—Our experience shows that 6-ft. bar lengths give maximum value in glass area per dollar in either single or double pitch skylights. You save money by designing skylights of this size.

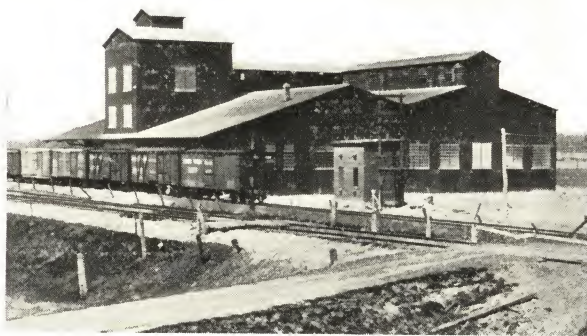
VERSATILITY IN GLAZING CONSTRUCTION.

Robertson glazing construction is pre-eminently suited to other uses besides skylights, such as monitor sash, sawtooth fronts, etc., both single and double glazed.

Widely used on all kinds of public, commercial and industrial buildings. Particularly adapted to extreme fume and moisture conditions. Gives maximum durability in chemical plants, foundries, silk and paper mills. Manufactured in a variety of shapes and sizes.

BULLETINS.

Interesting bulletins containing valuable engineering data and completely describing any of the Robertson Process products, together with an actual sample of Robertson Process Metal, will be sent on request.



SCOTTISH FERTILIZERS, LTD., WELLAND, ONT.
55,000 square feet of Robertson Process Metal on the roofs and siding of these buildings gives complete and permanent protection against the severe corrosive fumes to which fertilizer plants are constantly exposed.



MONTREAL HARBOUR SHEDS
This illustration shows part of Piers 18 and 19 erected by the Montreal Harbour Commissioners. Approximately 100,000 square feet of Robertson Process Metal were required on this work.

THE WM. RUTHERFORD & SONS CO., LIMITED

425 ATWATER AVENUE,
MONTREAL, QUE.

PRODUCTS.

LUMBER & WOOD PRODUCTS.

We make a specialty of STOCK MILLWORK. All kinds of HIGH-GRADE INTERIOR FINISH, DOORS, COLUMNS, FLOORING—HARDWOOD and PINE, PANELLING, STAIRWORK, SASH, NEWEL POSTS, etc.

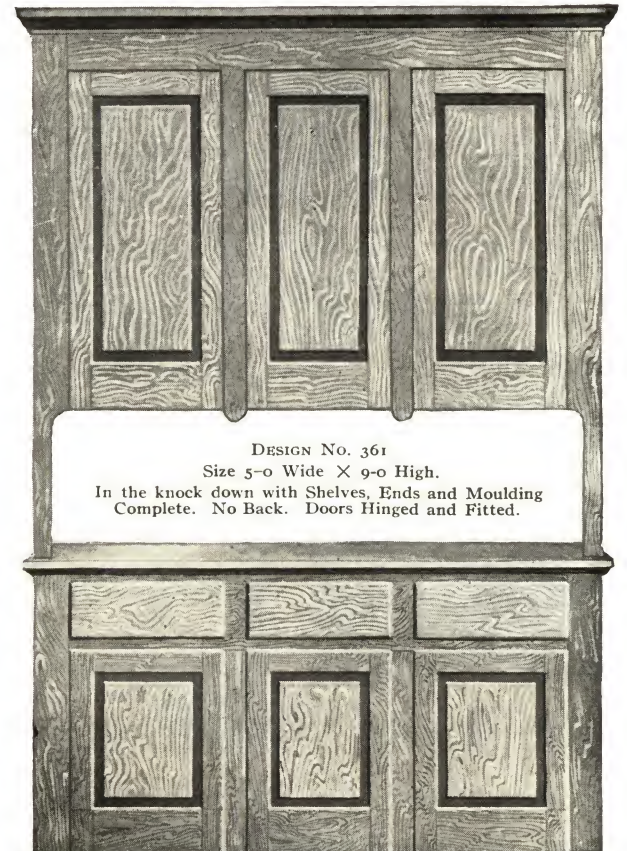
A full line of KORELOCK & MIRACLE doors carried in stock.

FACILITIES.

We have a very large, compact and modern plant, and our equipment in this regard is equal to any on the continent. Our facilities for handling high-grade work are up to date in every respect and backed by years of experience. Our special expert workmen will lay out work from Architects' details or from plans and specifications, all work being framed and fitted ready to set in place.

Send for our illustrated Catalogue on Stock Millwork Specialties, sent free on request.

See also our advertisement, page 208.



DESIGN No. 361
Size 5-0 Wide X 9-0 High.
In the knock down with Shelves, Ends and Moulding Complete. No Back. Doors Hinged and Fitted.



DESIGN No. 464
Sizes carried in Stock:
From 2-0 X 6-10 X 1 3/4
To 2-10 X 6-10 X 1 3/4



DESIGN B-3
Size carried in Stock:
2-10 X 6-10 X 1 3/4



KLIMAX 2 PANELS
Sizes carried in Stock:
From 2-0 X 6-8 X 1 3/4
To 2-10 X 6-10 X 1 3/4



"THE MONTREAL"
Sizes carried in Stock:
From 2-0 X 6-10 X 1 3/4
To 2-10 X 6-10 X 1 3/4

MIDLAND WOOD PRODUCTS, LIMITED

MIDLAND, ONT.

PRODUCTS.

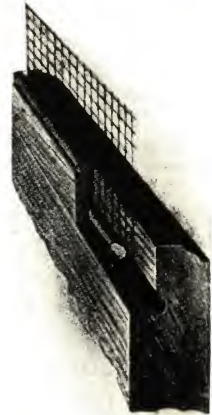
Manufacturers of NEVER RUST SCREENS, SCHOOL WARDROBES, ROLLING PARTITIONS, STAIRS, HARDWOOD FLOORING, MILLWORK of all kinds, Both Stock and to Architects' Details.

PLANT.

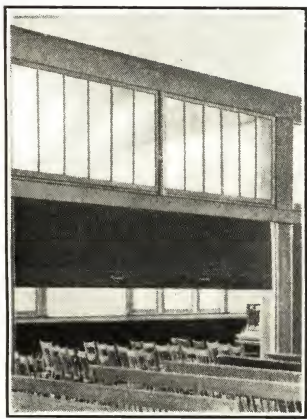
We have a Modern Plant and the Best Equipment obtainable. 20,000 sq. ft. of factory floor space.

SCREENS.

Our STANDARD SCREENS for Doors and Windows are made of Clear Pine, painted three coats with enamel finish in any color, and fitted with Bronze Rustless Screen Cloth and necessary hardware. They can be made of Oak or other hardwoods, finished in any desired shade.



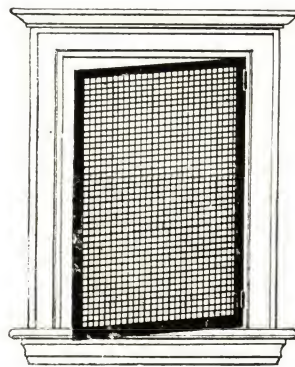
SHOWING METHOD OF
HOLDING SCREEN
CLOTH.



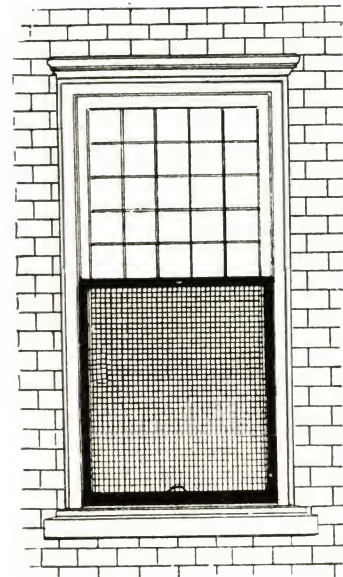
ROLLING PARTITIONS.
An ideal arrangement for dividing
Sunday School Class Rooms.



SECTION OF SLIDING SCREEN, SHOWING
SPRING GUIDES.



CLASS E.
CASEMENT WINDOW STYLE.
CAN BE OPENED THE SAME AS THE
GLASS WINDOW.



CLASS A
SLIDES UP AND DOWN LIKE THE WINDOW.



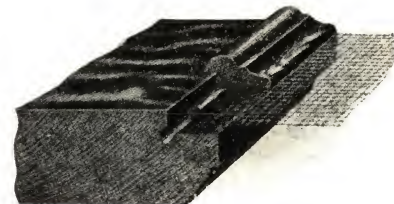
VENTILATED
SANITARY
OPENS EASILY.

EVANS VANISHING DOOR WARDROBE.

CLASS A.

Vertical air currents dry the clothes. Economy in floor space. Doors do not block the aisles.

NOISELESS
DOORS CANNOT
STICK.
CLOSES EASILY.



SECTION OF DOOR.

EVANS VAN-
ISHING DOOR
WARDROBES.

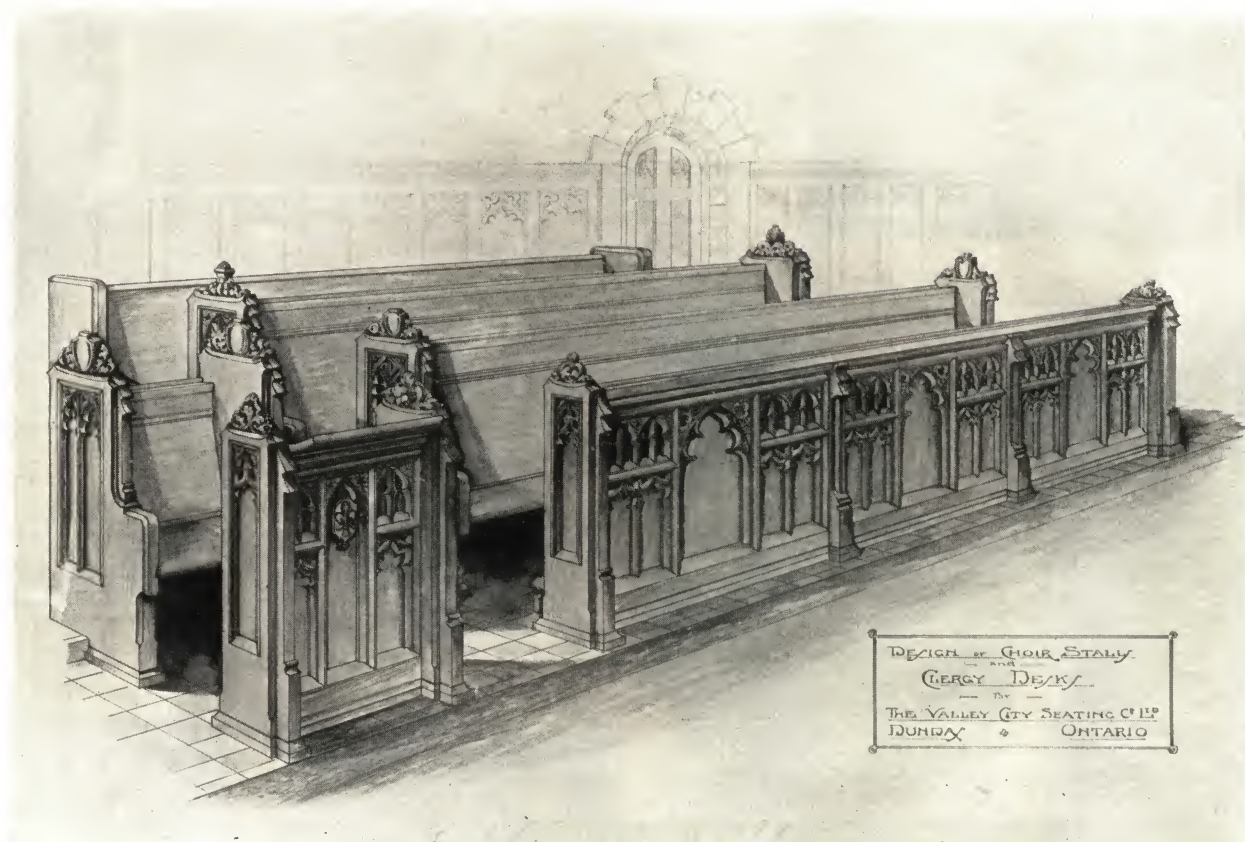
We are Canadian Manufacturers and Distributors of EVANS PATENTED VANISHING DOOR WARDROBES for all Canada, which cannot be equalled for Public or High School Wardrobe Purposes. They are economical and save floor space. Over 15% saved in Cost and Fuel.

WRITE FOR PARTICULARS.

THE VALLEY CITY SEATING CO., LTD.

FOR HIGH CLASS WOOD CRAFTSMANSHIP.

DUNDAS, ONTARIO.



CHANCEL STALLS

INSTALLED IN ST. MARTIN-IN-THE-FIELDS ANGLICAN CHURCH, TORONTO

WE SPECIALIZE

And will be pleased to submit quotations and specification data in respect to

CHURCH FURNITURE AND CHURCH SEATING

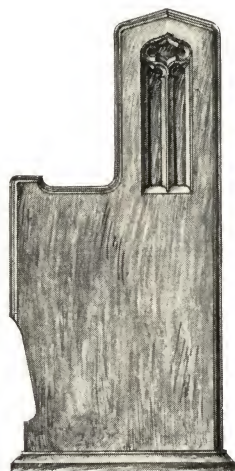
STRAIGHT OR CIRCULAR
of the Better Kind.

For all Denominations.

HIGH GRADE INTERIOR
WOODWORK

TO ARCHITECTS' DETAILS.

Every enquiry will have prompt and
careful attention.



PEW END NO. 990.

LODGE ROOM FURNITURE. ASSEMBLY HALL SEATING. SEATING AND FURNITURE

FOR

PUBLIC INSTITUTIONAL BUILDINGS.

We have a staff of Expert Wood-
carvers and will be pleased to submit
samples of their work and quotations to

ARCHITECTS AND CONTRACTORS.

Illustration shows one of our typical
PEW END DESIGNS. Special designs pre-
pared on request.

THE BUYER'S DOOR AND MANUFACTURING COMPANY LIMITED



OFFICE AND MILL: 366-400 PACIFIC AVENUE,
(WEST) TORONTO, ONT.



PRODUCTS.

We manufacture VENEERED AND PINE DOORS, STAVED COLUMNS for Exterior and Interior Use, FRAMES, SASH, FLOORING, PINE AND HARDWOOD TRIM, NEWEL POSTS, BALUSTERS, TURNINGS, STAIR MATERIAL, PANELLING, INTERIOR FITTINGS, GREENHOUSE MATERIAL, and we specialize on work from architects' plans and details.

DOORS.

We are specially well-equipped in our Door Department, having the best door machinery obtainable. In our Glue-Room we have a 100-ton Power Press, used exclusively on our Veneered Doors. Only thoroughly kiln-dried White Pine is used for our Veneered Door cores. Veneers in cabinet woods are always kept on hand for the manufacture of doors to detail.

Below we show a few cuts of the Doors we manufacture and stock.

COLUMNS.

High-grade Staved Columns manufactured in all kinds of wood, in any diameter and length, to architects' details, are a specialty with us. A large stock of WHITE PINE COLUMNS of different sizes in THE TUSCAN ORDER, always on hand, enables us to make prompt shipment.

NEWEL POSTS.

In Quarter-Cut Oak, Birch, Georgia Pine and Chestnut. Special Newels to detail quickly made to order.

BALUSTERS.

We carry a large stock of Round, Square and Octagon Verandah and Stair Balusters ready for immediate shipment, and we are well equipped for turning Balusters to detail; also Jacobean Turnings.

SASH.

Our complete, up-to-date Sash Machinery is able to turn out large quantities daily. All sash are dovetailed at the meeting-rail.

DETAIL WORK.

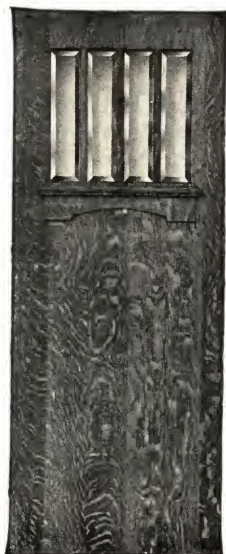
Our facilities for the execution of orders to special design from architects' plans and details are such that we can satisfactorily meet any requirement.



B.L. No. 316. CHESTNUT.



B.L. No. 317. FIR.



B.L. No. 334. 1/4-CUT OAK.



B.L. No. 335. 1/4-CUT OAK.



B.L. No. 340. CHESTNUT.

OUR PRODUCTS ARE OUR OWN MANUFACTURE.



DESIGN B.L.
No. 203.



DESIGN B.L.
No. 210.



DESIGN B.L.
No. 11.



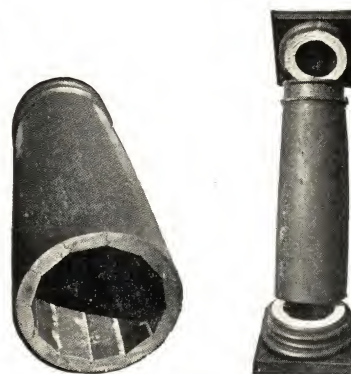
DESIGN B.L.
No. 13.



DESIGN B.L.
No. 14.



DESIGN B.L.
No. 16.



ILLUSTRATED CONSTRUCTION.

The above illustration shows our lock joint and our method of connecting the cap and base to the shaft of our stock columns. Both ends of the shaft are bedded in Mastic Putty. This is our own idea, and, as far as we know, is not in use by any other manufacturer. By this means it is impossible for water or moisture to get to the inside of our columns.

CATALOGUES.

A complete catalogue of our various lines will be mailed on request, and we particularly invite correspondence from architects, builders, and contractors regarding special work.



CHAMBERLIN METAL WEATHER STRIP COMPANY, LTD.

KINGSVILLE, ONT.

BRANCHES AND AGENTS:

HALIFAX, N.S., 154 Grenville St.
Phone 374.
KINGSTON, ONT., 41 Clarence St.
Phone 819.
LONDON, ONT., 20 McKinnon Place.
Phone 6339-W.
LONDON, ONT., 30 Evergreen Ave.
Phone 1504.
MONTREAL, QUE., 252 St. James St.
Phone 3436.
MOOSE JAW, SASK., 1120 Seventh St. N.W.
Phone 2111.
PETERBORO, ONT., 773 Aylmer.
Phone 1292.

BRANCHES OR AGENTS IN ALL THE PRINCIPAL
CITIES IN THE DOMINION OF CANADA.

BRANCHES AND AGENTS:

FORT WILLIAM: Gilmour & Hartwright.
REGINA, SASK., 2216 Elphinstone.
Phone 2314.
SYDNEY, N.S., 135 Esplanade.
SASKATOON, 332 1st Ave.
Phone 1699.

BRANCHES AND AGENTS:

ST. JOHN, N.B., 114-1/2 Princess St.
Phone 2479.
STRATFORD, ONT., 296 Erie St.
Phone 1024-K.
ST. THOMAS, ONT., 56 Arthur St.
TORONTO, ONT., 546 Yonge St.
Phone North 7140.
VANCOUVER, B.C., 572 Howe St.
Phone Sey. 1533.
WINDSOR, ONT., 136 Howard Ave.
Phone 1234 W.
WINNIPEG, MAN., Galt Bldg., Princess
and Bannatyne.
Phone Main G. 2499.

PRODUCTS.

METAL WEATHER STRIP IN ZINC, BRASS AND BRONZE.

Our Metal Weather Strip is the result of twenty-eight years of constant study and attention, during which time we have covered the field of practical devices very thoroughly. We are the pioneers in the Metal Weather Strip field, acquiring the first practical invention in 1894. Since then we have acquired, experimented with and tried out hundreds of ideas in an earnest effort to supply an equipment that will not only do what is intended, but will be practically indestructible.

CONSTRUCTION.

The entire rubbing surface of the metal in the Chamberlin Equipment is against wood. There are no metal or hard rubbing surfaces on which the Strip grinds or wears.

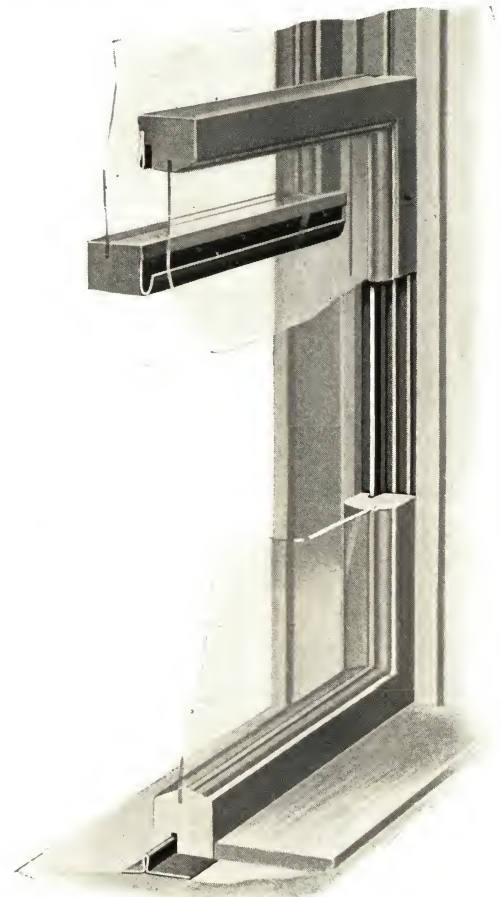
Metal against metal was abandoned by this Company seventeen years ago, when it was conclusively proven that the life of the Strip was short, even if a lubricant was used to facilitate easy operation. We experimented with a metal in metal combination for three years, but finally abandoned it on account of its inability to stand the wear.

LOOPED TONGUE.—The tongue of the Chamberlin Strip is wider at its tip than at its base—making a tight window without binding or sticking. The tongue touches the walls of the groove only at its outermost edges, thereby reducing the friction to a minimum and allowing the sash to shrink and swell without destroying the efficiency of the equipment—something impossible with any other type.

CORRUGATED SIDE STRIPS.—The side strips on which the window slides, in addition to having the looped tongue, have raised bearing points or corrugations on which the window slides. These corrugations take up the side play, because they fill the sash and the frame, holding same out evenly from the runway on both sides. This prevents the sash from jamming and sticking when raised or lowered, and permits the window sash to move as smoothly and evenly as a ball-bearing wheel.



MEETING RAIL.—The Chamberlin Meeting Rail is simple and efficient. The Strip is made of two members, the receiving strip being made of heavy metal, forming a rigid receiver for the member that is fastened to the upper rail of the lower sash.



APPRECIATION.

Private Office William C. Bailey, King Edward Hotel, Toronto.
Chamberlin Metal Weather Strip Co., Toronto. August 28th, 1914.

Gentlemen:—Every window in the King Edward Hotel is stripped with Chamberlin Metal Weather Strips, and after twelve years they are as good as new. We find them most satisfactory as they keep out the dust as well as the cold, and they hold the window firm and tight, doing away with any rattle or shaking on windy nights. We will be very happy to recommend them to any one desiring a good window strip.

Yours very truly,

KING EDWARD HOTEL,
(Signed) WM. C. BAILEY.

TESTIMONIALS.

List of principal installations, estimates, etc., furnished upon request.



Note how Side and Sill Strips are mitred together. Without this joint it is impossible to make an effective installation.

L. H. PETERS, LIMITED

10 ST. ANGELE STREET,
QUEBEC, QUE.

PRODUCTS.

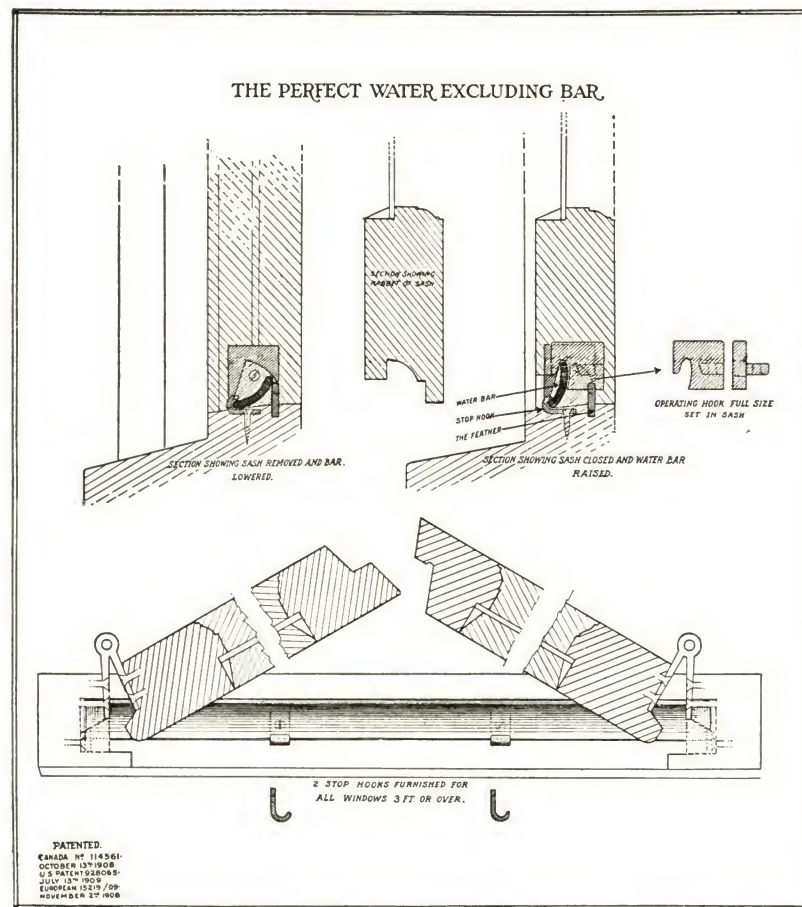
We are manufacturers of the "PERFECT" WATER EXCLUDING BAR, the most perfect excluding bar on the market, for Casement Sashes opening inward.

Also the "PRESTO" PATENT LOCK JOINT for English Window Sashes.

CONSTRUCTION.

The "PERFECT" Water Excluding Bar System consists of the ordinary iron sill bar or feather in use to cut sash joint. The water excluding bar proper is formed of a crescent-shape metal bar, which moves up and down when closing or opening sashes. It is held in place by two sockets, set into the frame, and small clips fixed to the sill. The right-side sash is fitted with a special hook, which catches and moves the water excluding bar in position.

The bars are made in Galvanized Iron, Statuary Bronze, Copper or Brass.



EFFICIENCY.

The efficiency of this bar is plainly shown by the fact that, when the sashes are closed, the bar rises a full 3-8 of an inch underneath the sash and, therefore, absolutely prevents water from getting in.

ADVANTAGES.

This device is very simple in construction, cannot get out of order, will last a lifetime, can be applied to old as well as new sashes, making all joints absolutely weatherproof.

This system is now in use in all kinds of buildings and is giving entire satisfaction.

THE HIGGIN MANUFACTURING COMPANY

ALL-METAL WINDOW SCREENS. ALL-METAL WEATHER STRIPS.

33-35 McCaul Street,
TORONTO, ONTARIO.

SALES AGENCIES IN PRINCIPAL CITIES.

PRODUCTS.

HIGGIN ALL-METAL WINDOW SCREENS.

THE HIGGIN ALL-METAL WINDOW SCREEN; WOOD FRAME DOOR SCREENS; THE HIGGIN SPECIAL SCREEN EQUIPMENT FOR PIVOTED STEEL SASH; THE HIGGIN ALL-METAL WEATHER STRIP.

The Higgin Metal-Frame Window Screen is made entirely of metal and is adapted for use on either wood or metal window casings. It is especially suited to fireproof buildings. It is set just outside the upper sash and requires only 9-16 inch space, which includes the guide strips or channels in which the screen slides.

CONSTRUCTION.—The frame is of hollow construction, so made that no solder is used, thus making it possible to thoroughly enamel the inside as well as the outside of the steel frame and bake it at the high temperature necessary. The corners are reinforced with triple steel angles, locked mechanically, no soldering or brazing being used.

RE-WIRING.—The netting is held in the groove by means of a stiff, non-resilient spline, so formed as to roll into place and lock. This spline can be removed for the purpose of re-wiring the screen without danger of damaging it, making it unnecessary to order new splines from the factory.

SHAPES.—Screens can be made of any necessary shape to fit bow, circle top or round windows.

THE HIGGIN EQUIPMENT FOR PIVOTED STEEL SASH.

Eliminates the necessity for basket or cage screens, and offers the most practical solution of the problem of screening ventilating steel sash.

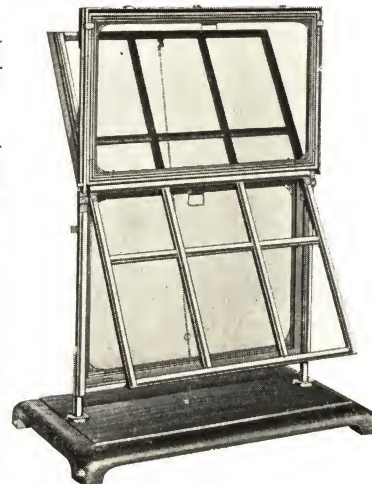
THE HIGGIN ALL-METAL WEATHER STRIP.

The Higgin Equipment for sliding windows consists of two strips, one of which is attached to the window frame and is made with a $\frac{3}{8}$ -inch tongue or raised portion that forms a track on which the sash slides. This track is usually made of zinc, but bronze may also be used.

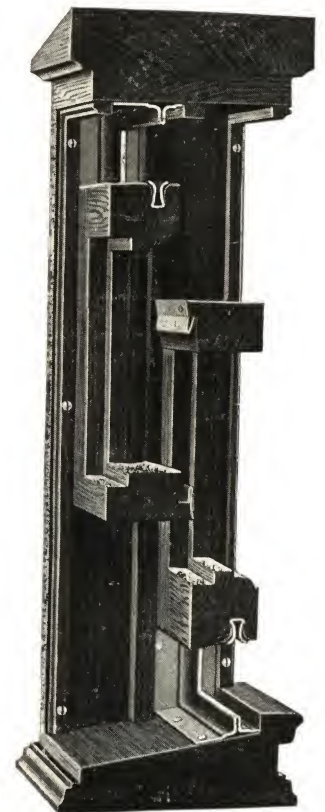
The other strip, called the insert, is made of very light spring bronze, and is inserted in a groove made in the sash and slides on the track strip. The spring flanges of the insert lightly contact with the tongue of the track and effectually seal the aperture. As the insert is higher than the tongue of the track, there is no chance for it to cut the insert.

At the meeting-rail a zinc strip is attached to the lower rail of the upper sash and a spring bronze strip to the upper rail of the lower sash in such a manner that, as the sashes are closed, the strips interlock, sealing up the opening completely.

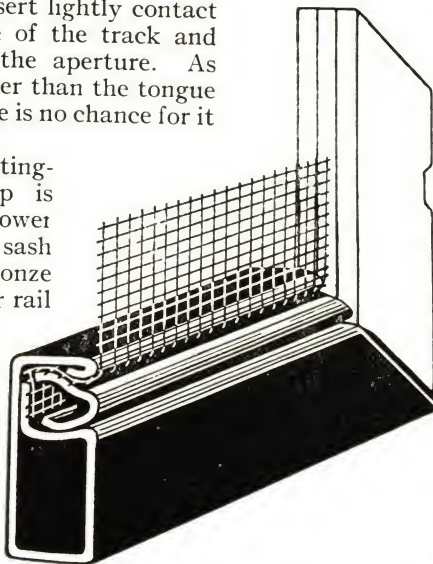
For case-ment windows and doors we make a number of strips specially designed to conform to the different conditions to be met.



EQUIPMENT FOR PIVOTED STEEL SASH.



SECTIONAL VIEW SHOWING COMPLETE WEATHER STRIP EQUIPMENT FOR DOUBLE HUNG WINDOW.



FULL SIZE SECTIONAL VIEW SHOWING CONSTRUCTION.



CORNER SECTION SHOWING LIFT AND SIDE SPRING.

THE HAMILTON COTTON COMPANY, LIMITED

HAMILTON, ONTARIO.

OUR PRODUCTS ARE SOLD BY ALL THE LEADING HARDWARE DEALERS IN CANADA.

PRODUCTS. We manufacture "HERCULES" AND "STAR SPIRAL" brands of BRAIDED SASH CORD.

"HERCULES" BRAND. The reputation of "Hercules" has been thoroughly established in the Canadian market for many years. It compares in quality with the best imported brands, but is sold at a considerably lower price. It can be safely recommended for any job.

"STAR SPIRAL" BRAND. There is no better sash cord on the market. It is made from a superior grade of cotton, designed especially for very heavy sash and will outwear chain. It is known by the blue spiral strand running through the cord.

SPECIFICATION. Architects' specifications should read: "Windows to be hung with No..... sash cord (Hercules or Star Spiral)." The size of the cord and the size of pulleys should agree with the manufacturer's list, as printed below.

SCIENTIFIC TESTS. Tests have been made at the University of Toronto (Strength of Material Laboratory) which prove our claims as to quality.

SERVICE. "Hercules" and "Star Spiral" sash cords are stocked by all the leading hardware dealers in Canada. They can be secured without difficulty.

MADE IN CANADA. As there is no possible doubt of the quality of "Hercules" and "Star Spiral" sash cords, why not always recommend and specify *Canadian Made Cord*?

The illustrations and information given herewith may be of use in making up specifications.



SIZE No. 6. DIAM. 3-16 IN.
About 18 lbs. per doz.; about 66 ft. per lb.
Suitable for weights of less than 5 lbs. Minimum diam. of pulley allowable, 1½ in.



SIZE No. 9. DIAM. 9-32 IN.
About 33 lbs. per doz.; about 36 ft. per lb.
Suitable for weights from 20 to 30 lbs. Minimum diam. of pulley allowable, 2¼ in.



SIZE No. 7. DIAM. 7-32 IN.
About 22 lbs. per doz.; about 55 ft. per lb.
Suitable for weights from 5 to 12 lbs. Minimum diam. of pulley allowable, 1¾ in.



SIZE No. 10. DIAM. 5-16 IN.
About 44 lbs. per doz.; about 27 ft. per lb.
Suitable for weights from 30 to 40 lbs. Minimum diam. of pulley allowable, 2½ in.



SIZE No. 8. DIAM. ¼ IN.
About 27 lbs. per doz.; about 44 ft. per lb.
Suitable for weights from 12 to 20 lbs. Minimum diam. of pulley allowable, 2 in.



SIZE No. 12. DIAM. ⅜ IN.
About 60 lbs. per doz.; about 20 ft. per lb.
Suitable for weights from 40 to 50 lbs. Minimum diam. of pulley allowable, 3 in.

The number indicates the diameter in 32ds of an inch.

LARGER SIZES.

LARGER SIZES THAN THOSE SHOWN ABOVE.

"Hercules" and "Star Spiral" Cords are also made in larger sizes, from size No. 14, diam. 7/8 in., to size No. 20, diam. 5/8 in., suitable for use for dumb-waiters, etc.

S. BOURASSA & FILS, LIMITEE

TELEPHONE
LA SALLE 3352

1613 NOTRE DAME ST. EAST
MONTREAL, QUE.

ESTABLISHED IN
1892

MANUFACTURERS OF HIGH GRADE HARDWOOD FITTINGS

PRODUCTS.

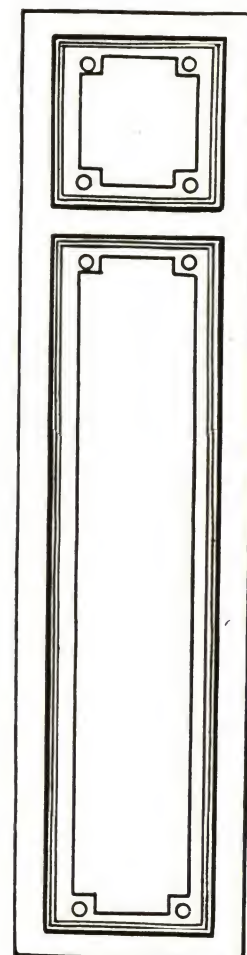
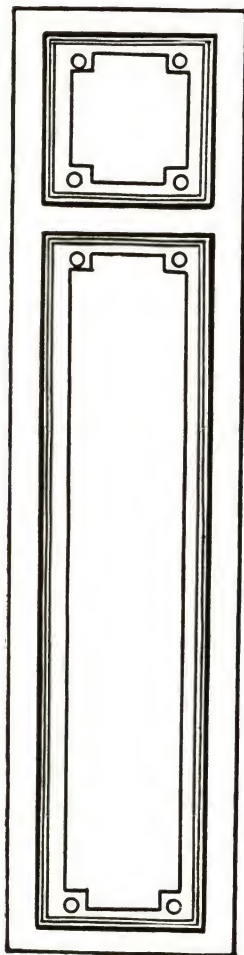
INTERIOR TRIM of all descriptions for Beautiful Homes, Commercial Offices, Banks, Churches, Public Buildings, Stores, Schools, etc., made according to Architects' plans, details and specifications; and will be pleased to submit quotations on any kind of plain or elaborate artistic work of modern or period designs.

MANTELPieces.

We particularly specialize in the making of Mantelpieces and carry a line of standard models. Special models made from Architects' designs to minute details when so desired.

STORE FITTINGS.

We are Manufacturers of every possible requirement for the equipment of the Modern Store, from roof to basement in every department, including Wall Display Cases, Show Cases, Shelvings, Partitions, etc.



FURNITURE.

For the last 30 years, our firm has been well known as makers of Artistic and Period Furniture intended to match interior decorations. Our expert Designer and staff of Cabinetmakers are at the disposal of anyone wishing perfect interpretations in furniture selection. Repairs to old and rare furniture a specialty. Also inlaid work and carving by experts.

ENQUIRIES.

Every enquiry from Architects, Contractors and Builders will have prompt and careful attention.

THE MARBLELOID COMPANY

MANUFACTURERS OF AND CONTRACTORS FOR FIREPROOF PLASTIC FLOORING.

461-8th AVENUE AT 34th STREET, NEW YORK, N.Y.

CANADIAN AGENTS

QUEBEC, - - - H. K. FERGUSON, 908 New Birks Bldg., Montreal.
 ONTARIO, - - - JOHN LINDSAY, 250 Richmond St. W., Toronto.
 ALBERTA, - - - AMERICAN AGENCIES, LTD., 1001-4th St. W., Calgary.
 MANITOBA, - - - N. J. DINNEN & Co., Nokomis, Bldg., Winnipeg.
 BRITISH COLUMBIA, S. A. FOSTER, 425 Standard Bldg., Vancouver.
 NOVA SCOTIA - - - EAGAR, COOMBS & Co., LTD., Halifax.

MARBLELOID

The Universal FLOORING
for Modern Buildings

FACTORY: NEW DURHAM, N.J.

PHYSICAL CHARACTERISTICS, AND ADVANTAGES.

MARBLELOID is a standardized composition flooring, sanitary base, wainscot, trim, tread, etc. Applied in a plastic state it sets rapidly into a tough, elastic monolithic body having a fine-grained, smooth surface. It is fire-proof, resilient and of high sanitary value. It is non-dusting, non-absorbent and easily kept clean. It possesses high resistance to compression and abrasion. MARBLELOID resists a tendency to crack and bonds perfectly to wood, concrete or steel; it is applied on old foundations as well as in new construction. It is most attractive in finish and appearance and is made in all colors.

WIDE RANGE OF ADAPTABILITY.

Over 11,000 MARBLELOID installations have been placed for the most diversified types of service. The material is made up in varying formulæ, depending upon the use to which the floors will be put. MARBLELOID is the ideal flooring for office buildings, stores, banks, theatres, churches, hospitals, institutions, clubs, schools, residences and is frequently used in warehouses, industrial plants and power houses where it will withstand severe wear.

MARBLELOID SERVICE.

CREWS ARE MAINTAINED AT THE PRINCIPAL BUILDING CENTRES. ALL INSTALLATIONS ARE MADE BY THE COMPANY'S SKILLED MECHANICS, ESPECIALLY TRAINED. Preliminary to starting installation, an inspection of foundations is made by an engineer thoroughly familiar with all phases of building construction.

Every shipment of material is analyzed and tested before it leaves our factory.

IMPORTANT NOTE.

MARBLELOID differs from the usual magnesite flooring in components and methods of application, and bears no relation or resemblance to floors based upon dolomitic magnesite, which is chemically unsuited for flooring use. Unfortunately numerous floors manufactured from such a magnesite have been installed in Canada.

GUARANTEE.

The Marbleloid Company rigidly guarantees the quality of its material and all work performed by its mechanics and will repair free of charge all defects due to the use of improper materials or workmanship.

RELATIVELY LOW COST.

MARBLELOID is permanent. It requires no unusual or expensive foundation and may be installed upon a single wood flooring, directly upon a concrete floor arch or upon a concrete fill thereon. Prices of MARBLELOID flooring, sanitary base, wainscoting, etc., vary with the area involved, the character of foundation (wood, concrete, steel, etc.), and location. Upon receipt of data comprehending the above, quotations will be furnished.

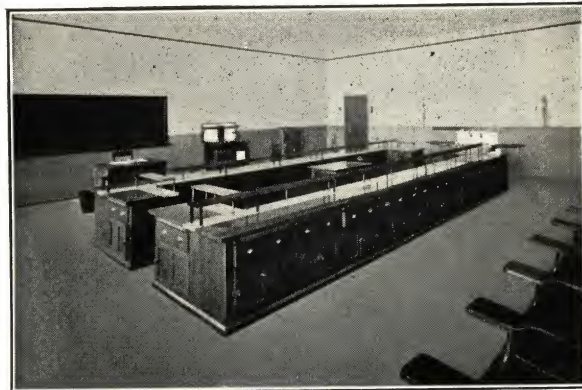
SPECIFICATIONS.

It is advisable that architects and engineers secure a copy of the printed MARBLELOID specification sheet giving foundation requirements and details of construction before specifying the material. Samples, color card, booklet, list of completed contracts, etc., will be mailed also upon request.

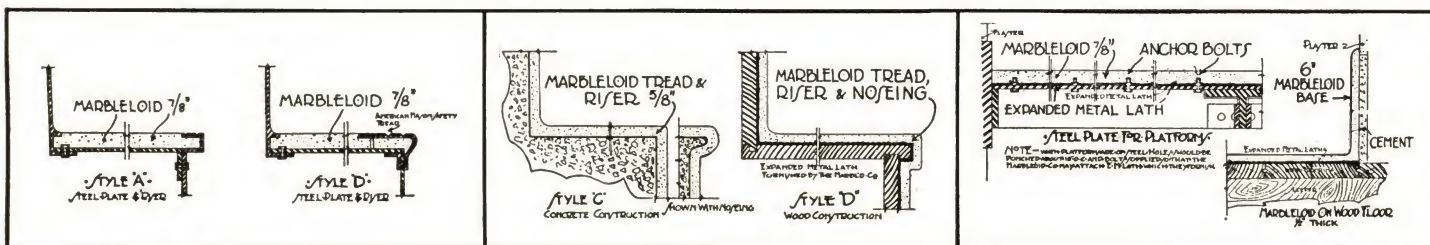
REFERENCES.

Among the installations made in Canada are the following:—

St. Denis Theatre, Montreal	Messrs. Barott, Blackader & Webster, Architects.
Terminal Warehouse Reg'd, Montreal	Mr. E. P. Hanna, Treasurer.
Devonshire School, Montreal	Ross & MacDonald, Architects.
Lorne School, Montreal	Ross & MacDonald, Architects.
Maisonnette School, Montreal	Ross & MacDonald, Architects.
Molson's Bank, Montreal	Philip J. Turner, Architect.
Molson's Bank, Windsor	Philip J. Turner, Architect.
Merchants' Bank, Windsor	Wells & Grey, Contractors.
Childs Company, Office Bldg., Toronto	J. C. Westervelt, Architect, New York
Northern Aluminum Co. Offices, Toronto	Archibald & Holmes, Engineers and Gen. Con.
Spectator Building, Hamilton	McPhie & Kelly, Architects
Hamilton & Toronto Sewer Pipe Co., Hamilton	McPhie & Kelly, Architects
Chipman Holton Knitting Co., Office Building, Hamilton	Stuart & Sinclair, Architects.
Victoria Hospital, Halifax	S. M. Brookfield, Ltd., Contractors.
Wood Department Store, Halifax	J. P. Dumaresq, Architect.
Dominion Government Radio Station, Halifax	Dominion Government.
Dominion Arsenal, Lindsay	Westinghouse, Church, Kerr & Co., New York City.
Bank of Sarnia, Sarnia	Walls & Bennett, Architects.
Sarnia-Hydro Electric System, Sarnia	J. E. R. Phelps, Manager.
Medical and Surgical Clinic, Peterboro	Ephgrave & Barrett, Architects.
Sudbury Mining & Technical School, Sudbury	Sherwood Construction Co., Contractors.
Mutual Life Building, Waterloo	Dickie Construction Company, Contractors.



CANADIAN INSTALLATION—MARBLELOID FLOORING IN SCHOOL LABORATORY.



SECTION SHOWING METHOD OF APPLICATION OF MARBLELOID IN DIFFERENT TYPES OF CONSTRUCTION.

VULCAN ASPHALT AND SUPPLY COMPANY, LIMITED

604 TRUST & LOAN BUILDING, WINNIPEG, MAN.

1544 BLOOR STREET WEST, TORONTO, ONT.

CONTRACTORS AND DISTRIBUTORS:

AGENTS FOR

BARBER ASPHALT COMPANY

PHILADELPHIA, PA.



COLD STORAGE AND INSULATING ASPHALTS
GENASCO VULCANITE ASPHALT MASTIC
GENASCO POSITIVE SEAL WATERPROOFING
STANDARD TRINIDAD BUILT-UP ROOF
GENASCO READY ROOFING AND SHINGLES
ASPHALT FELTS AND FABRICS

MASTIC FLOORS
AND WATER-
PROOFING.

WHERE USED.

ASPHALT
MASTIC
ADVANTAGES.
INSTALLATION

USERS OF
MASTIC.

Genasco Vulcanite Asphalt Mastic is a mixture of Trinidad Lake Asphalt, a softer asphalt or flux, and a mineral aggregate, consisting of properly graded sand or gravel. If an acid-proof mix is desired, the mineral aggregate consists of a grit of silicious nature, containing no limestone, lignite, loam or other matter of vegetable or calcareous nature.

Mastic is adapted for floors, sidewalks, waterproofing, tanks, pipe and reservoir linings, stair treads, etc.

As a flooring: Where heavy traffic is encountered, as in industrial establishments, warehouses, shipping departments, train sheds and platforms, machine shops, docks, etc. Where acid or water conditions prevail, as in battery rooms, chemical plants, laboratories, pulp and paper mills, bottling establishments, etc. Where sanitation is essential, as in schools, hospitals, food producing industries, abattoirs, public buildings, etc.

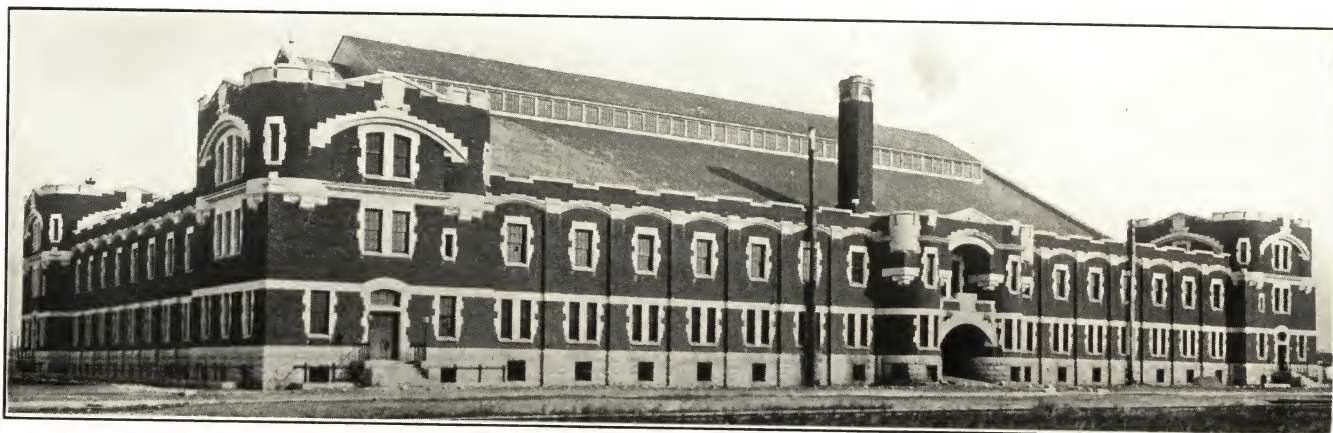
As a waterproofing material: For lining swimming pools and reservoirs, waterproofing conduits, bridges, tanks, pipes, etc.—as used by the Boards of Education, Toronto and Ottawa.

Mastic resists heavy traffic, is waterproof, resilient, and does not become slippery. It is dustless, easily cleaned and easily repaired if damaged.

Mastic can be laid over old concrete or wooden floors, as well as in new construction. It hardens quickly and can be used within an hour after laid. In resurfacing operations, it can be installed while the plant remains in operation.

Mastic is mixed on the job, and laid while hot. The thickness ranges from one inch to 1½ inches. If over an inch thick, the floor is generally laid in two layers.

We have installed more than 200,000 square feet of Genasco Mastic for the Canadian Pacific Railway Company, and over 100,000 square feet for the Dominion Government in various drill halls, post offices, and other federal buildings. We also number among our clients the T. Eaton Company, Revillon Bros., Ltd., Hudson's Bay Company, Gunns Ltd., Harris Abattoir, Gordon Ironside Fares, Ltd., and others.



MINTO STREET ARMOURIES, WINNIPEG, MAN.

TRINIDAD LAKE
ASPHALT
BUILT-UP
ROOFS.

Standard Trinidad Roofs are constructed of alternate layers of Trinidad Lake Asphalt and asphalt saturated felts. They can be laid over either boards or concrete. The roof over boards contains 128 pounds of waterproofing material and 22 pounds of felt per square; that over concrete containing 168 pounds of waterproofing and 22 pounds of felts. The asphalt is mopped on the roof while hot, the whole forming a smooth, unbroken surface.

Only all-waterproof materials are used in Standard Trinidad roofs. No top coating of gravel or slag is required, or used, to protect the asphalt; hence there are no stones or pebbles to clog gutters and drains. Resists fumes, gases and weather for years.

STANDARD
TRINIDAD
INSTALLATIONS.
WATERPROOFING
BY GENASCO-
POSITIVE SEAL
METHODS.

Standard Trinidad roofs have been installed by us on the Manitoba Parliament Buildings; Westminster Military Hospital; Quaker Oats Building, Saskatoon; Dominion Linseed Company, Winnipeg; and many other buildings.

Materials compounded from native asphalts meet every water and damp-proofing requirement in subway or tunnel construction, foundation work, bridges or conduits, steel construction, etc.

Specifications and complete information for any waterproofing operation will be furnished on request. We have installed the waterproofing systems at the Manitoba Parliament Buildings, Canadian Pacific Railway Station at Winnipeg, High Level Bridge of the C.P.R. at Edmonton, and other operations.

Asphalts especially designed for use in refrigerating, cold storage and other plants, and for insulating purposes.

COLD STORAGE
AND INSULAT-
ING ASPHALTS.
ASPHALT FELTS
AND BURLAP.
SERVICE.

Felts and fabrics scientifically treated to resist water and dampness; useful in many processes of building construction.

With a wide experience in laying Mastic, installing built-up roofings, and waterproofing under exacting conditions, we are in a position to render exceptional service, no matter what the conditions may be.

Specifications and detailed information regarding our several lines of activity will be gladly furnished.

VULCAN ASPHALT & SUPPLY CO., LIMITED.

604 TRUST & LOAN BUILDING, WINNIPEG, MAN.

1544 BLOOR STREET WEST, TORONTO, ONT

CANADIAN REPRESENTATIVES FOR T.M.B. FLOORING—THE COLOURED MASTIC FLOOR

MANUFACTURED BY

THOMAS MOULDING BRICK COMPANY

CHICAGO, ILL.

T.M.B.
FLOORING

THE COLOURED MASTIC
FLOOR

T.M.B. FLOORING. THE COLOURED MASTIC FLOOR.

A material quite distinguished from ordinary composition flooring in that it is of an asphaltic nature, consisting of refined elaterite and asbestos and, therefore, not subject to chemical change like all types of magnesite flooring. It has all the advantages of ordinary Asphalt Mastic Flooring with the addition of a more pleasing appearance. Supplied in green, red and black. Applied over wood or cement floors, suitable for all corridor areas, for class rooms in schools, wards in hospitals, gymnasiums, laboratories, lavatories, and offices. It is an elastic, fire resisting, non-slippery and noiseless floor of a highly sanitary character, and has the great advantage of being easily repaired with an invisible patch, in this respect having no equal in any other type of flooring.

T.M.B. INSTAL- ATIONS IN CANADA.

High River Municipal Hospital, High River, Alberta
St. Joseph Hospital, Peterborough, Ont.
Brant Sanatorium, Brantford, Ont.
Clinic Building, Welland, Ont.
Dewson Street Public School, Toronto, Ont.
Fern Avenue Public School, Toronto, Ont.
Manning Avenue Public School, Toronto, Ont.
Earlscourt Public School, Toronto, Ont.

Oakwood Collegiate, Toronto
Robert Meek Public School, Kingston, Ont.
St. Clair Separate School, Windsor, Ont.
Ridley College, St. Catharines, Ont.
New Police Station, Windsor, Ont.
Robert Simpson Co. Ltd., Toronto, Ont.
Empire Theatre, Toronto, Ont.

T.M.B. Flooring has been extensively used in the U.S. for many years, and has proven its superior qualities over other flooring, and numbers amongst its users many of the leading American Architects.

PAR-LOCK PLASTERING.

PAR-LOCK PLASTERING.

The mechanical method of permanently bonding plaster to structural surfaces. The efficient and most economical method of plastering fire resisting ceiling and side wall construction, overcoming all transmission of moisture, stain and detachment.

THE PROCESS OF APPLYING PAR-LOCK.

The Par-Lock process hermetically seals the structural surfaces with a pure Asphalt Compound principally composed of Trinidad Native Lake Asphalt and applied at normal temperature in successive layers, sufficiently heavy to receive a coarse rock grit. This grit is driven into the Asphalt while it is still wet, forming a rock Asphalt Mastic which quickly hardens, presenting an unexcelled rough rock faced key of minor but uniform suction. This forms a positive damp-proof binder and scratch coat to receive the plaster applied by other trades.



PREPARATION OF CEILING SURFACE FOR PLASTERING
APPLICATION OF PAR-LOCK WATERPROOF ROCK AND ASPHALT MASTIC KEY

APPLICATION OF PAR-LOCK.

Par-Lock is applied only through the Par-Lock equipment. It is driven under approximately 60 pounds air pressure from the Par-Lock Asphalt Gun, which is automatically regulated so that the surfaces are cleaned and all surface pores opened. The Bond is expanded to a fine film and driven over and into the surface in repeated layers, sufficiently heavy to receive and hold the rock grit in the form of a mastic. The crushed rock is driven into the wet bond until it is entirely charged with all the rock that it will contain and until the surface shows only the dry rock uniformly imbedded over the entire area.

H. H. SYMMES & COMPANY, LIMITED

Halifax Agent:
W. H. NOONAN, ROY BLDG.

24 BOARD OF TRADE BUILDING

Toronto Agent:
JOHN LINDSAY, 250 RICHMOND ST. W.

Quebec Agent:
A. D. MASSON, 160 ST. JOHN ST.

MONTREAL, P.Q.

London Agent:
C. A. FRASER, BOX 166.

Contractors for all classes of ROCK ASPHALT MASTIC WORK, MEMBRANE WATERPROOFING,
and DURAFLEX COLORED MASTIC FLOORS. All work installed by our own skilled workmen.

PRODUCTS.

SYMMES' GREASE-RESISTING MASTIC FLOORS (Registered at Ottawa and Washington) MASTIC ASPHALT laid with genuine European NATURAL ROCK ASPHALT MASTIC, which is a natural impregnation of limestone in place, by bitumen. Mined in Italy, Switzerland, Germany and France, and imported by us. This is the highest grade of Mastic and gives the greatest service. Where required, Domestic or Manufactured Mastic, bid on.

ASPHALTAZA FLOORING.

This is a Rock Asphalt Mastic Floor 1" thick, including marble chips and polished off like an ordinary Terrazza floor. A 4" or 6" border of marble about walls, columns, etc., is frequently used. The marble chips against the black background being very effective, this floor retains all the physical advantages of mastic, being non-cracking, waterproof, etc., and easy to walk on.

ACID-PROOF MASTIC FLOORS.

These are guaranteed strictly acid-proof and contain only the purest bitumens and graded silica mineral aggregate. For Tank Linings, Floors, etc., will carry trucking and teaming.

MEMBRANE WATERPROOFING APPLICATION AND USE.

Built up Membrane with burlap, felts, and SYMMES' FLEXIBLE ASPHALT CEMENT, for foundations, Railroad Subways, Bridges, etc.

The use for Mastic is very wide, ranging from roads and driveways, bridge coverings, damp coursing, flooring, cove base, stair treads, tank linings (acid and water) to roofing which will carry traffic, either foot or teams.

Mastic is resilient, easy to walk on, will not crack or break up under the heaviest trucking or teaming. Is perfectly water, damp, and vermin-proof. It is odorless and no dust can be made from it. When laid it has a smooth even surface, dark grey in color. It is a non-slip floor and makes the best "safety tread," used in schools and hospitals for this reason.

For floors it is laid in varying thicknesses, depending on the work to be carried, from $\frac{3}{4}$ " to $1\frac{1}{2}$ ".

On wood base, thickness should not be less than 1".

Old worn floors, driveways, etc., of wood, brick, stone, or concrete, which are still strong enough to carry the work, may readily be resurfaced, prolonging their life for many years.

Only rough concrete base, screeded strictly to required grades, needed. No trowelling or smoothing with a shovel. All permanent fixtures such as floor drain hoppers, etc., should be rigidly fixed in place before Mastic is applied.

The average life of these floors is from twenty to twenty-five years, many have been in use over thirty years, with practically no upkeep cost.

ESTIMATE.

We are at all times most willing to submit promptly estimates on any quantity of work. Prices vary with area to be covered, thickness of floor, and location.

GUARANTEE.

All our work carries our rigid guarantee against failure due to faulty material or workmanship for a period of five years from the date of completion.

DURAFLEX FLOORING

Duraflex will give all types of floors a new permanent wearing surface. This applies to cement, composition, etc., as well as worn splintered wood floors. It is applied as a cold paste of artificial rubber, and forms one continuous, seamless, rubbery sheet over the entire floor. It is durable, resilient, quiet, dustless, fire-resisting and impervious to water and acids.

It is guaranteed not to crack, wrinkle, crawl, disintegrate or come loose, and cannot be permanently injured. It will last as long as the building, because the surface is renewable. Laid in colors of dark green or dark red.

This floor is for Banks, Hospitals, Institutions, Schools, Offices, etc. The Metropolitan Life Bldg., New York, N.Y., has 60,000 square feet. The Pennsylvania Railroad has covered the entire station floors and treads with DURAFLEX.

Specifications, references, prices, etc., promptly furnished. All work done by our own skilled workmen, and guaranteed by us. We are the sole Canadian Agents for DURAFLEX.

MASTIC REFERENCES.

Harbour Commissioners, Montreal, 500,000 sq. ft.

Canadian Pacific Railway, Montreal, over ten acres in Angus Shops alone. Also work at North Toronto Station, Quebec Station.

Grand Trunk Railway, Montreal—all Point St. Charles Machine Shop.

Canadian Kodak Co., Toronto.

Imperial Tobacco Co., Ltd., Montreal.

W. C. Macdonald Tobacco Co., Montreal.

Canada Paper Co., Windsor Mills, Que.

Montreal Abattoirs, Ltd., Montreal, Que.

J. R. Booth, Ottawa, Ont.

E. B. Eddy Co., Hull, Que.

Canada Sugar Refining Co., Ltd., Montreal, Que.

T. Eaton Co., Ltd., Toronto and Moncton, N.B.

Architects we have worked for: Messrs. Darling & Pearson, Toronto; Sproatt & Rolph, Toronto; Ross & Macdonald, Montreal; John S. Archibald, Montreal; and many others.

Work installed from Halifax to Winnipeg.

THE BUILDERS MOULDING CO., LIMITED

MANUFACTURERS OF "ACME" FLOORING.

52 NOBLE STREET,
TORONTO, ONT.

PRODUCT.

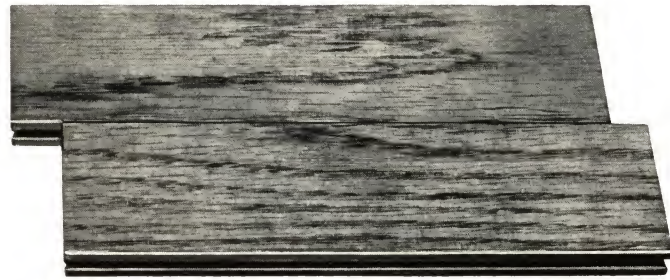
We are manufacturers of "ACME" BRAND HARDWOOD FLOORING, which is made from selected MAPLE, BIRCH, BEECH and OAK (quarter cut and plain).

FACILITIES.

Our Dry Kilns have a very large daily capacity and are equipped with the latest devices for drying lumber artificially. Our workmen are well trained in securing the best results by avoiding "cooking" the stock and thus destroying its fibre, on the one hand, or under-drying it on the other. This is very important, as the life of the floor as well as its appearance largely depends on the material being properly kiln dried, and unless this is done the flooring cannot be depended upon to give entire satisfaction after it is laid.



QUARTER SAWED, TONGUED AND GROOVED, END MATCHED OAK FLOORING.



PLAIN SAWED, TONGUED AND GROOVED, END MATCHED OAK FLOORING.

STANDARD THICKNESSES AND WIDTHS.

13/16-in. thickness: Widths, 1½-in. face, 2-in. face and 2¼-in. face.
3/8-in. thickness: Widths, 1½-in. face, 1¾-in. face and 2-in. face.

GRADES.

The grades of oak flooring are known as XXX Clear, which is our best grade, and XX No. 1, which is our second grade.

QUARTER SAWED.

XXX CLEAR.—Shall have one face practically free from defects; the question of colour is considered; lengths in this grade to be 2 ft. and up, not to exceed 15% under 4 ft.

XX No. 1.—May contain bright sap and will admit pinworm holes, slight imperfections in dressing or a small, tight knot, not to exceed one to every 3 ft. in length; lengths to be 1 ft. and up.

PLAIN SAWED.

XXX CLEAR.—Shall have one face practically free from defects; the question of colour is considered; lengths in this grade to be 2 ft. and up, not to exceed 15% under 4 ft.

XX No. 1.—May contain bright sap and will admit pinworm holes, slight imperfections in dressing or a small, tight knot, not to exceed one to every 6 ft. in length; lengths to be 1 ft. and up.

USES.

XXX CLEAR, QUARTER SAWED. Red or White.—High class residences, hotels, apartment houses and club houses.

XX NO. 1, QUARTERED. Red or White.—Economical substitute for clear quartered where a dark finish is desired. These grades make a flooring equally as durable as the first grade.

XXX CLEAR, PLAIN SAWED. Red or White.—High class residences, hotels, apartment houses and club houses.

XX NO. 1, PLAIN SAWED. Red or White.—Medium priced residences, hotels and apartments, schools, office buildings and stores.

ESTIMATES.

We will appreciate architects and builders giving us the opportunity to figure on their flooring requirements.



THE PEDLAR PEOPLE LIMITED

EXECUTIVE OFFICES, OSHAWA, CAN.

FACTORIES: OSHAWA AND MONTREAL

ADDRESS NEAREST BRANCH.

MONTREAL,
26 Nazareth St.

OTTAWA,
Banque Nationale Bldg.

TORONTO,
473 College St.

HAMILTON,
Clyde Block,
King & Hughson Sts.

WINNIPEG,
80 Lombard St.

VANCOUVER
318 Homer St.



"PERFECT" EXPANDED METAL LATH.

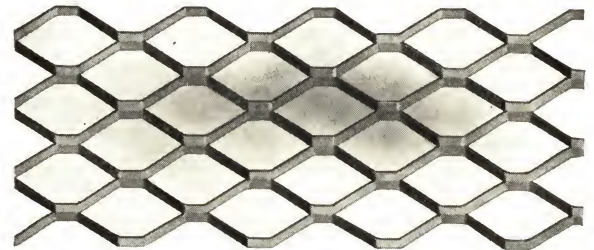
"THE KEY IS
THE THING."

Pedlar's "Perfect" Expanded Metal Lath has a neat, small mesh, which is formed by the natural bend of the strands in expanding the metal, overcoming any tendency to rupture the fabric. These strands furnish a superior bonding surface by allowing the mortar to completely embed the lath on both sides, the clinch bonding at the back.

"Perfect" Lath has been used on many prominent buildings erected in Canada in recent years. Furnished in 26, 24 and 23 gauge, painted or galvanized.

Size of sheets, 24 in. wide x 97 in. long (length charged for, 96 in.).

BUNDLES.—Number of sheets in a bundle, 9. Number of yards in a bundle, 16.



"PERFECT" EXPANDED METAL LATH.

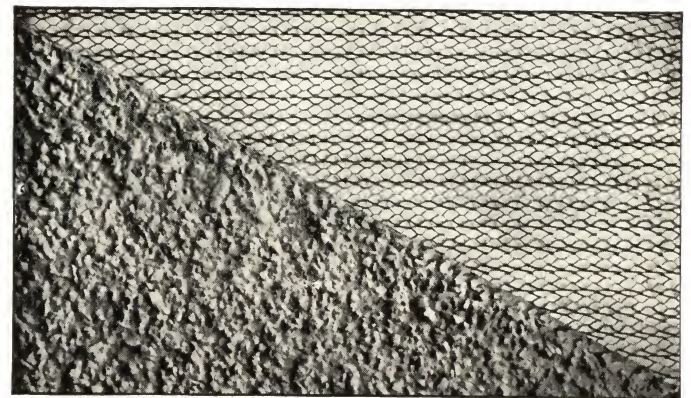
TRUSS FABRIC FOR STUCCO WORK.

Pedlar's "Perfect" Truss Fabric is the "Perfect" Metal Lath corrugated after being expanded. By corrugating the lath, an absolute key is secured behind the face of the fabric, and the slab becomes reinforced, rendering cracking of plaster and disintegration impossible; an incomparable medium for all stucco or roughcast work.

Standard sizes of sheets, 22 in. x 96 in.; furnished either painted or galvanized; applied with metal lath staples or our special flat-headed nails. Full directions for stucco work on application.



SECTIONAL
VIEW.



TRUSS FABRIC PARTIALLY PLASTERED.

METAL CORNER BEADS.

"PERFECT,"
"SUPERIOR,"
AND
"IMPERIAL."

The efficiency of Pedlar's Metal Corner Bead, made in three styles as illustrated, as a builder and protector of all plastered corners and angles, its ready and easy adaptability to all conditions that may exist in a building which reduces its cost of application, its straight and rigid construction, which insures a perfect alignment of the corner, recommends its use for all buildings.

Made of galvanized stock, in lengths of 4, 5, 6, 7, 8, 9, and 10 feet. In three distinct sizes, adaptable to every requirement.

METAL LUMBER.

Pedlar's Metal Lumber is made of heavy gauge pressed steel, either painted or galvanized, designed to secure the maximum of strength with minimum weight.

FURRINGS, CHANNELS, STUDS, Etc.

Pedlar's Metal Lumber is made in the form of Furring Strips, T and Channel Studs, Channels, Angles, etc. These, used in conjunction with "Perfect" Lath, Rib Fabric and Ferro Dovetail Plates, make a fireproof construction.

REED CONCRETE CLIP.

The Reed Concrete Clip is a scientifically constructed clip for wrapping Beams, Girders, Channels, Columns, etc., consisting of steel wire members running parallel to beams, etc., with rigidly welded clips at specified intervals.

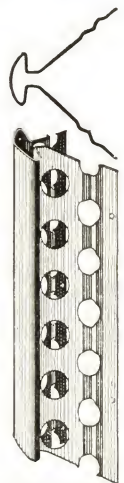
Made in 4 and 5 foot lengths with clips at 6, 8, or 11½ inch centres—supplied with 1, 2, or 3 longitudinal members as required. Write for full particulars.



"PERFECT"
CORNER BEAD.



"IMPERIAL"
CORNER BEAD



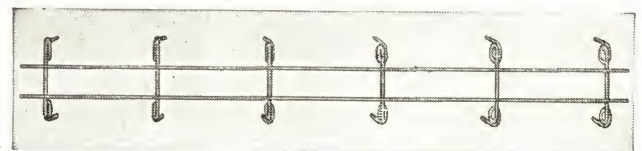
"SUPERIOR."
CORNER BEAD



SHEET STEEL CHANNEL STUD FOR
HOLLOW PARTITION.



SHEET STEEL FURRING STRIP.



REED CONCRETE CLIP FOR BEAMS, ETC.

Write us for free Catalogues on these products. Also see our advertisements on pages 14-16 and 47.



YOU CAN'T EXPECT BEAVER BOARD RESULTS UNLESS THIS TRADE-MARK IS ON THE BACK OF THE BOARD YOU BUY.

THE BEAVER COMPANY, LTD.

MANUFACTURERS OF

BEAVER BOARD, BEAVER BLACKBOARD (BLACK AND GREEN) AND VULCANITE ASPHALT SHINGLES AND ROLL ROOFING.

ADMINISTRATION OFFICES:

THOROLD, ONT., CANADA.

BUFFALO, N.Y., U.S.A.

LONDON, ENGLAND.

TIMBER OPERATIONS AT FREDERICKHOUSE AND CHARLTON, ONT.

MILLS AND PLANTS AT THOROLD AND OTTAWA, ONT.

EASTERN SALES OFFICE:

THOROLD, ONT.

WESTERN SALES OFFICE:

WINNIPEG, MAN.

Distributors and Dealers Everywhere.

BEAVER BOARD.

The Beaver Company, Ltd., is the sole manufacturer of Beaver Board, for better walls and ceilings, and the world's largest producer of wood fibre wall-board. This company also produces Beaver Blackboard in black and green finish and Vulcanite Asphalt Shingles and Roll Roofings.

Beaver Board is actually re-created lumber built up from the shredded fibre of Northern Canada Spruce into large, sturdy, flawless panels three-sixteenths of an inch thick, 32 or 48 inches wide and from six to sixteen feet long. It weighs about one-half pound per square foot.

WHERE BEAVER BOARD IS USED.

Beaver Board builds better walls and ceilings in new homes and old, in stores, offices, factories, garages; in short, wherever crack-proof, jar-proof, trouble-proof and repair-free walls and ceilings are desirable. "Beaver Board and Its Uses" describes many of the good uses of Beaver Board. Send for a copy.

APPLICATION OF BEAVER BOARD.

In new frame construction Beaver Board is nailed directly to the studding and joists, headers being inserted where necessary to provide a nailing surface for all panel edges and back of all mouldings, top of baseboard, and behind plumbing, lighting and heating fixtures.

Brick or concrete walls must first be furred with strips of about 1" x 3" lumber. Over old plaster or matched lumber walls no preparation is necessary.

Panel centres should be nailed first, using three-penny finishing nails about fifteen inches apart. Then all four edges should be nailed with three-penny flathead nails about six inches apart and at least three-eighths of an inch in from the edge of the panel.

Immediately after nailing, the panels may be painted with any good interior flat or oil paint or calcimine. Decorative strips or mouldings over the panel intersections complete the job and the room is ready for immediate use.

"The Application and Decoration of Beaver Board" outlines the various steps of Beaver Board construction more fully than is possible here. A copy will be sent gratis on request.

BEAVER BLACKBOARD.

BLACK AND GREEN FINISH.

BEAVER BLACKBOARD.

Beaver Blackboards provide better writing surfaces for school rooms at reasonable cost. All processes in the manufacture of these boards are carried out within the Beaver Board organization, making it possible to give them a uniformity of color and quality that natural slate does not have.

The base of Beaver Blackboard is made of a special 5-ply Beaver Board which insures a large flawless slab that will not crack or disintegrate.

DURABLE WRITING SURFACE.

The writing surface is developed by a series of slating coats that have been worked out scientifically by the Beaver Board laboratories. In addition to the usual dull black surface, Beaver Blackboard may be obtained in a restful green color that relieves eye-strain and gives a pleasing touch of color to otherwise sombre walls.

SIZES AND WEIGHTS.

The boards come in standard blackboard widths of 3, 3½ and 4 feet, and even foot lengths from six to sixteen feet. Weight, crated, about one pound per square foot.

Write the Thorold office for samples of Beaver Blackboard in both colors and the name of your nearest distributor.



See also our advertisement on page 44.

MANITOBA GYPSUM COMPANY LIMITED.

MANUFACTURERS OF

"EMPIRE" WALL PLASTERS, "EMPIRE" HYDRATED LIME, "EMPIRE" WALL BOARD, ETC.

GENERAL OFFICE, SALES OFFICE, MILL AND PLANT:
WINNIPEG, MAN.

QUARRIES: GYPSUMVILLE, MAN.

PRODUCTS.

"EMPIRE" BRANDS OF WALL PLASTER:—"EMPIRE" WOOD FIBRE PLASTER, HARDWALL PLASTER No. 1, "GOLD DUST" FINISH (No. 2), "EMPIRE" FINISH PLASTER, "GILT EDGE" PLASTER OF PARIS, "ACOLITE" BOND (for concrete), "EMPIRE" HYDRATED LIME, "EMPIRE" WALL BOARD, "EMPIRE" KEENE'S CEMENT, "MEDUSA" WATERPROOFING, "EMPIRE" FIREPROOF TILE, "GYPSOLITE" WALL TINT.

SUPERIORITY OF GYPSUM WALL PLASTERS.

Wall Plaster manufactured from Gypsum, has entirely taken the place of all other Wall Plasters.

Gypsum Plasters are fireproof and practically indestructible.

Gypsum Plasters are easily worked and have good setting and maturing qualities, thus enabling the plasterer to cover more space in a given time than with any other plastering material.

TESTS.

All our products are thoroughly tested and are guaranteed to give good results—provided materials are used in accordance with our published specifications.

"EMPIRE" KEENE'S CEMENT.

"EMPIRE" Keene's Cement is fully equal to any of the imported Keene's; and is a particularly adaptable material for Base, Mouldings, Wainscoting, Castings, or where any work requires hardness, which can only be obtained by the use of high-grade Keene's Cement. Write for specifications.



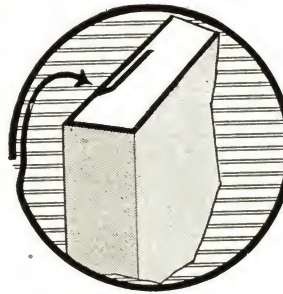
"EMPIRE" Wall Board is composed of Gypsum (Plaster of Paris) fibred with wood—rigidly compressed between two sheets of strong fibrous paper to a uniform thickness and a smooth surface.

"EMPIRE" Wall Board won't burn, warp, buckle, swell or shrink.

"EMPIRE" Wall Board is sound proof, vermin proof and sanitary.

"EMPIRE" Wall Board is permanent and economical.

"EMPIRE" Wall Board is a non-conductor of heat and cold.



STANDARD SIZES.

"EMPIRE" Wall Board is made in the following Standard Sizes, which meet practically every building requirement:—

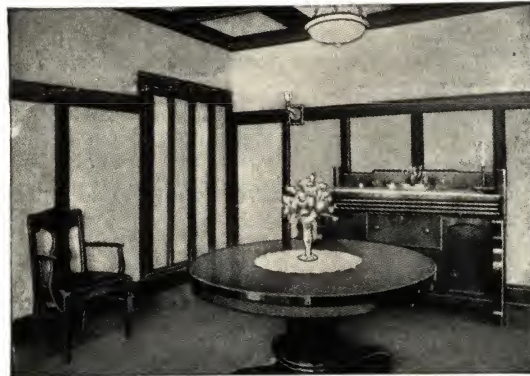
$\frac{5}{16}$ in. thick x 32 in. wide x 3, 4, 6, 8 and 10 ft. long.

$\frac{3}{8}$ in. thick x 48 in. wide x 4, 6, 8 and 10 ft. long.

THE TURNED EDGE IMPROVEMENT.

The reinforced, turned edge, as illustrated, is an exclusive feature of "EMPIRE" Wall Board. It provides an extra strong edge for nailing; and as all edges are true and of uniform thickness, tight flush joints are assured.

"EMPIRE" Wall Board takes any form of decorative treatment—Paint, Calcimine or Wall Paper, and can be panelled if desired. It can also be used as a base on which to plaster and for sheathing under siding or shingles. Write for our booklet giving advantages, uses and specifications.



USED AS A PANELLED WALL BOARD.



USED AS A BASE FOR HARDWALL OR WOOD FIBRE PLASTER.

"GYPSOLITE" WALL TINT.

"Gypsolite" is a Cold Water Paint or Calcimine. Write for Colour Card and Instructions for using.



"EMPIRE" Hydrated Lime is a product formed by the addition of quantities of water to known weights of freshly burned quicklime, the finished material being a flour-like powder of great fineness, covering capacity and tensile strength. It is all pure white lime.

"EMPIRE" Hydrated Lime should be specified for White Coat (plaster finish), Brick and Stone Work, Waterproofing Concrete—when used with "Medusa" Waterproofing, also for Whitewashing and other Sanitary Purposes. Write for Specifications and Instructions in regard to using "EMPIRE" Hydrated Lime.

"EMPIRE" FIREPROOF TILE.

"EMPIRE" Fireproof Tile is a Fireproof material composed of pure Gypsum Plaster, bonded with fibre and made into block form. It is used for fireproofing of structural steel, for wall furring, block tile, insulation from heat and cold and for sound deadening.

"EMPIRE" Fireproof Tile is light in weight, low in cost, high in quality, fireproof, sound-proof, an insulator, and quickly erected.

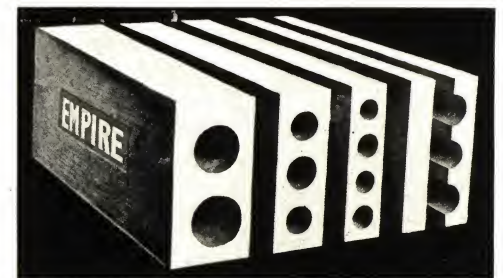
"EMPIRE" Fireproof Tile is an insulator of sound.

"EMPIRE" Fireproof Tile is absolutely straight and can be laid perfectly true and to a line.

"EMPIRE" Fireproof Tile is made from 2 to 6 inches in thickness.

Standard Sizes and weights of "EMPIRE" Fireproof Tile:—

2" x 12" x 30"	weighs	9 1/4 lbs. per sq. ft.	solid.
2" x 12" x 30"	weighs	6 1/4 lbs. per sq. ft.	furring.
3" x 12" x 30"	weighs	9 1/4 lbs. per sq. ft.	hollow.
4" x 12" x 30"	weighs	12 1/4 lbs. per sq. ft.	hollow.
5" x 12" x 30"	weighs	15 lbs. per sq. ft.	hollow.
6" x 12" x 30"	weighs	16 1/2 lbs. per sq. ft.	hollow.



"EMPIRE" FIREPROOF TILE.

EBSARY GYPSUM CO., LIMITED

AGENTS:

MONTREAL: H. K. FERGUSON.

HALIFAX: EAGAR COOMBS CO.

WINDSOR, ONT.:

CALDWELL SAND & GRAVEL CO.

OFFICE: 81 VICTORIA STREET, TORONTO, ONT.

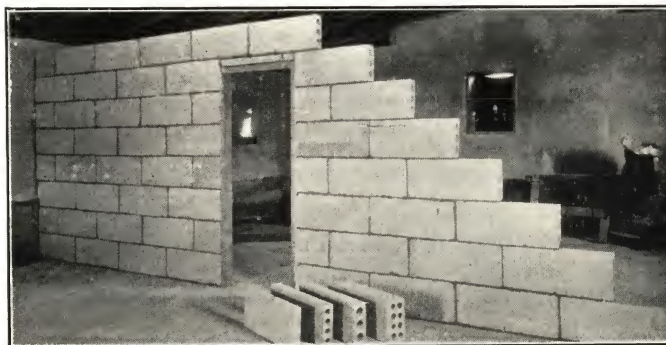
MILL: CALEDONIA, ONT.

GYPSUM BLOCK.

MADE IN CANADA.

EBSARY GYPSUM PARTITION BLOCKS

EBSARY GYPSUM PARTITION BLOCKS are the best material for partitions, column covering, wall furring and vent flues. They are light in weight, fireproof, non-conductors of heat, cold and sound; economical to use and are APPROVED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS. They are 2" to 8" thick, 12" wide and 30" long.



PARTITION WITH BLOCKS GROUPED IN FRONT.

EBSARY GYPSUM ROOF BLOCKS

EBSARY GYPSUM ROOF BLOCKS are precast at the mill, and are kiln dried before shipping. They are 15" wide, 4" thick and in various lengths up to 7' 0" and are laid up on top of steel beams or purlins and all four joints filled with gypsum mortar. Each block is reinforced to carry the necessary roof loads. On account of their lightness in weight—about 20 lbs. per sq. ft.—and freedom from condensation they are the ideal material for the construction of roofs of industrial plants, power houses, theatres and garages.



ROOF OF TEMPLE THEATRE, BRANTFORD, ONT.

EBSARY GYPSUM FLOOR FILLER BLOCKS

EBSARY GYPSUM FLOOR FILLER BLOCKS are used in reinforced concrete floors as a filler between concrete beams. The advantages of this type of floor construction are that it is light in weight,—thus saving in structural steel; only a minimum amount of forms are required; it gives a flat ceiling, and only two coats of plaster are required. In freezing weather the block helps largely to protect the concrete from freezing when being placed. This type of floor is more sound proof than any floor now on the market.



FLOOR OF KING EDWARD HOTEL, TORONTO, ONT.

INFORMATION

Full information and estimates will gladly be given to Architects, Engineers and Contractors.

KEYSTONE FIREPROOFING CO. OF CANADA, LTD.

MONTREAL:
603 NEW BIRKS BUILDING.

QUEBEC:
203 ST. JOHN ST.

MARBRIDGE BUILDING,
NEW YORK, N.Y.

TORONTO ONT:
250 RICHMOND ST., W.

PRODUCT.

METROPOLITAN SYSTEM of Fireproof Floor and Roof Construction.

For the past twenty-five years the METROPOLITAN SYSTEM has been installed and is giving entire satisfaction in all types of buildings, more especially in Office Buildings, Hotels, Hospitals, Apartments, Theatres, Churches and Industrial Plants.

ADVANTAGES.

The Metropolitan System of Fireproofing has many advantages, but the chief of these may be summed up as follows:

SAFETY AND STRENGTH—Steel Wire Cables support the entire load and the strength may be calculated with absolute accuracy.

ECONOMY OF FIRST COST—(a) Is the lightest type of fireproof floor and roof construction. (b) Owing to lightness of slab a smaller tonnage of steel is required. (c) Can be mixed and handled faster than concrete. The composition sets within 30 minutes after the slab is poured and the forms can be dropped within 60 minutes. Cold weather does not affect its installation.

DURABILITY—Gypsum, the principal ingredient of Metropolitan System, is recognized as the best preservative of metal work against corrosion of any material available for fireproofing purposes.

FIRE RESISTANCE—By numerous tests as well as actual fires it has convincingly demonstrated its superiority over other fireproofing methods and materials.

LOW MAINTENANCE—Owing to its elasticity the annoyance and expense of constant repairs are eliminated. The System remains intact under severest conditions.

NON-CONDUCTIVITY.

The Composition used in the METROPOLITAN SYSTEM consists principally of pure calcined gypsum, together with a percentage of wood chips. Calcined gypsum is generally recognized as the most effective fireproofing material that is known commercially. It develops the highest degree of fire resistance and non-conductivity ever obtained in any material used for this purpose.

The wood chips give to the composition a degree of toughness and elasticity far greater than found in any other fireproofing material. The quantity being small, they are completely insulated by the greater mass of gypsum in which they are embedded and in no way detract from the fire-resistance of the composition.

Gypsum has a far greater insulating value than clay or cement tile, stone or cinder concrete. The co-efficient of expansion of METROPOLITAN COMPOSITION is practically zero.

A series of interesting tests recently conducted by Professor C. L. Norton of the Massachusetts Institute of Technology prove conclusively the superiority of METROPOLITAN COMPOSITION as a non-conductor over all other fireproofing materials on the market. A copy of Professor Norton's report will be mailed free upon request.

ABSENCE OF CONDENSATION.

Condensation troubles can be traced directly to materials possessing an inadequate insulating value. Differences between interior and exterior temperatures cause moisture to collect, with consequent annoyance and damage.

The high insulating value of METROPOLITAN COMPOSITION insures against condensation. Striking proof on this point is furnished by the experience of a large power company in Canada.

Prior to their first experience with the METROPOLITAN SYSTEM, they had found it necessary to install a hung ceiling about six feet below the concrete roofs on their turbine stations. This air space prevented condensation.

During 1914 they installed the METROPOLITAN SYSTEM on their newest and largest turbine station, without the hung ceiling. With a temperature under the slab exceeding 100°, combined with outside temperatures running as low as 30° below zero, they advise that there has not been the slightest trace of condensation on the under side of the METROPOLITAN Slab.

ABSENCE OF CONDENSATION AND NON-CONDUCTIVITY PARTICULARLY ADAPTABLE TO PAPER AND SILK MILLS.

GUARANTEED CONSTRUCTION.

The METROPOLITAN SYSTEM is installed only by our own Construction Department. By scientific training and organization of our field forces we are able to install same for the absolute minimum cost. To this policy we attribute the fact that no Metropolitan Floor or Roof has ever failed in a test or an actual fire.

We guarantee every square foot of the Metropolitan System which we install against any defects in materials, workmanship or design and against failure from any cause, under the conditions for which it was designed.

This company regards each contract that it executes as a sale of service as well as material and workmanship.

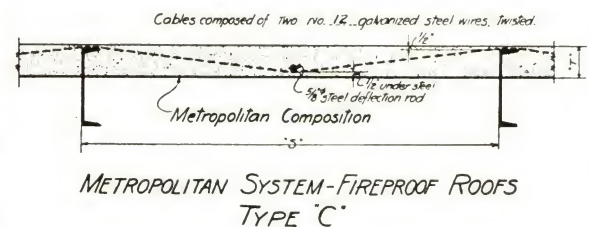
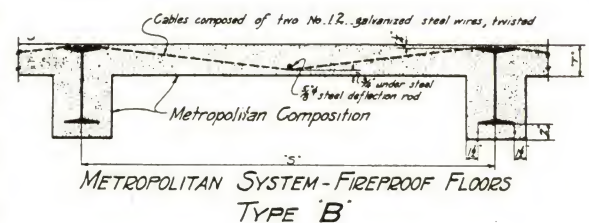
INSTALLATIONS.

For one large Industrial Plant we have made no fewer than 24 installations, representing over 1,600,000 square feet. In others we have made as many as 12 and 15 installations.

The following are a few of our many Canadian installations:

Main Building, Brown's Copper & Brass Rolling Mills, Toronto.
Gurney Foundry Co., Ltd., Toronto. Witchall & Sons, Gen. Cont.
Technical School, Toronto. Norcross Bros. Co., Gen. Cont.
Theatre, Toronto. Jos. T. Turner, Architect.
Pantages Theatre, Toronto. Jackson-Lewis Co., Ltd., Gen. Cont.
Motor & Axle Buildings, General Motors, Ltd., Walkerville, Ont.
Royal Bank of Canada, London, Ont. Purdy & Henderson, Gen. Cont.
Machine Shop Extension, Montreal Locomotive Works, Montreal.

Foundry, Montreal Locomotive Works, Montreal.
Crane Runway Building, Steel Co. of Canada, Montreal.
Office Bldg., Can. Vickers, Ltd., Montreal. E. G. M. Cape, Gen. Cont.
Longueuil School, Montreal. Guertin & Bouchard, Gen. Cont.
Bell Telephone Co. Addition, Montreal. Anglin's, Ltd., Gen. Cont.
Wayagamack Pulp & Paper Co., Three Rivers, Que.
T. Pringle & Sons, Gen. Cont.
Machine Room, Abitibi Paper & Pulp Co., Iroquois Falls, Ont.



STINSON-REEB BUILDERS' SUPPLY COMPANY, LIMITED

9TH FLOOR READ BLDG.,
MONTREAL.

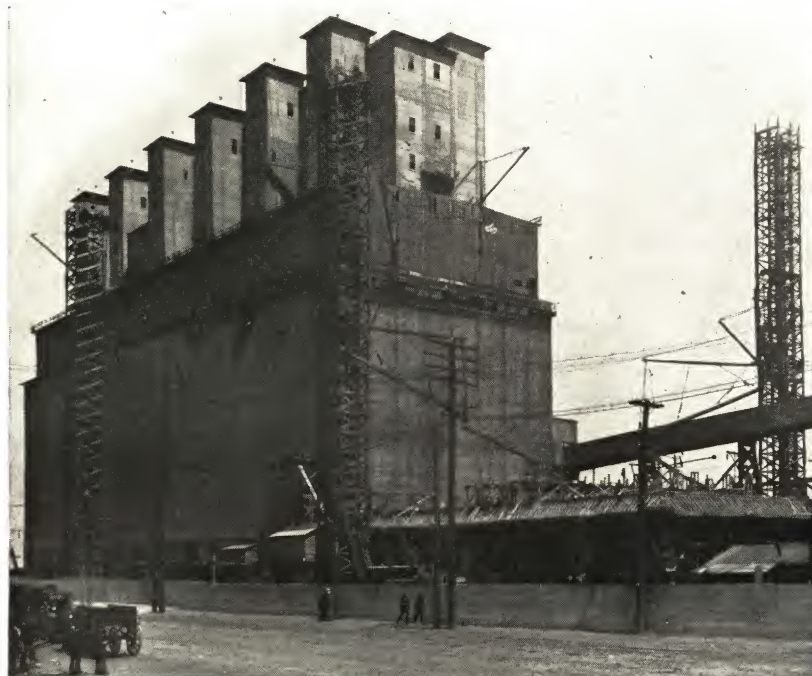
DEALERS IN GENERAL BUILDING MATERIALS.

PRODUCTS.

We manufacture: MEDUSA WATERPROOFING COMPOUND.
"FLAWLESS" WALL PLASTERS.
CAEN STONE CEMENT.
POZZO STUCCO.
CRUSHED MARBLE.

MEDUSA WATER- PROOFING

"Medusa" Waterproofing is a dry white powder, consisting of fatty acids, chemically combined with lime. Owing to its extreme fineness it may easily be perfectly mixed with cement in the necessary proportions. "Medusa" Waterproofing gives absolutely permanent results. It does not affect strength, setting or color of Portland Cement.



30,000 LBS. MEDUSA WATERPROOFING USED IN
No. 2 ELEVATOR, MONTREAL HARBOR COMMISSIONERS.
MESSRS JOHN S. METCALFE CO., LIMITED, ENGINEERS AND CONTRACTORS.

REPRESENT- ING.

We are representatives for:

AMERICAN ENAMELED BRICK & TILE CO.,	Enamel Brick and Tile.
BRANTFORD ROOFING CO. LIMITED,	Prepared Roofing and Paints.
METROPOLITAN PAVING BRICK CO.,	Paving Blocks.
NAILCRETE CORPORATION,	Fireproof Nailing Compound.
SOUTH AMBOY TERRA-COTTA CO.,	Ornamental Terra-Cotta.
SANDUSKY CEMENT CO.,	Medusa White Cement.
A. C. HORN COMPANY,	Floor Hardeners, etc.
SPECIAL SERVICE FLOORING CORP.,	Mastic Floors.
WILSON CORPORATION, J. G.,	Steel Doors and Diffuselite Blinds.
KNAPP BROTHERS,	Plasterers' Metal Specialties.

THE ONTARIO GYPSUM CO., LIMITED

BRANCH OFFICES:
 CALEDONIA, ONT.
 TORONTO, ONT., 106 DON ESPLANADE
 MONTREAL, QUE., 374 BEAVER HALL SQUARE.

HEAD OFFICE: PARIS, ONT.

GYPSUM MINES, PLASTER MILLS.
 CALEDONIA, ONT.
 LYTHMORE, ONT.

MANUFACTURERS OF

"PARISTONE" HARD WALL PLASTER
 "PULPSTONE" HARD WALL PLASTER
 "CROWN BEAVER" HARD WALL PLASTER
 "CROWN THISTLE" HARD WALL PLASTER

"STANDARD WHITE" CALCINED PLASTER
 "ALABASTINE" GYPSUM BLOCKS
 "GYPSUM" BOARD
 "GYPROC" WALL BOARD

"ALABASTER," "CROWN" AND "NATIONAL" BRANDS HYDRATED LIME
 LAND PLASTER, BUG FINISH, ETC.
 AGENTS SIMPLEX STEEL PRODUCTS CO.

IMPROVED HARDWALL PLASTER (HAIR FIBRED AND WOOD FIBRED), GYPROC FINISHING PLASTER, PLASTER OF PARIS, HYDRATED LIME, KEENE'S CEMENT, GYPSUM BLOCK.

IMPROVED PARISTONE.

HARDWALL PLASTER (HAIR FIBRE)—We have recently installed at our mills, machinery which has made a wonderful improvement in our Hardwall. It is more plastic, will spread easier, and hold water better. Paristone is made to be mixed with sand at the job. Sets in a few hours with many times the strength and hardness of lime mortar, and in a short time the walls are dry. No waiting for weeks for the plaster to dry and months for it to attain its full strength.

GYPROC FINISHING PLASTER.

A pure Gypsum finish, manufactured by our new patented process, ready for the wall by the addition of water only. It will work more plastic, cooler, and spread farther than the old style lime and plaster of Paris; will not chip or crack when applied to a dry wall, even if not troweled. The spreading capacity and ease of applying is astonishing. It eliminates the addition of plaster of Paris, time taken mixing or "circling" on mixing board by an expensive plaster, labor, soaking, etc. Can be decorated in two or three days.

GYPSUM BLOCK FOR HOUSE CONSTRUCTION.

Practical, economical, fire safe. Your home is perfectly insulated. Warm in winter, cool in summer. Each block is a unit of $2\frac{1}{2}$ sq. feet. Rapidly laid. Exterior stucco can be applied to exterior of block and plaster to interior.

Walls are laid up in two courses, one 4" block and one 3" block, with air space between of 2". Write for costs and full information.



HYDRATED LIME.

"ALABASTER," "NATIONAL," and "CROWN" A pure white dolomitic or high magnesium lime of greatest purity and strength. Put up in 50-lb. paper bags. Especially suitable for plastering, bricklaying and masonry. It has many advantages over lump lime. For waterproofing and lubricating concrete, add 5% to 15% Hydrated Lime, the amount varying as the sand is fine or coarse.

KEENE'S CEMENT—BEST BROS.

Best Bros.' Keene's Cement contains no retarder; can be retempered as often as necessary; is comparatively slow-setting, and is very hard and strong, without being brittle. It can be worked over thoroughly until all marks of joinings or other inequalities are removed. Properly applied, Best Bros.' Keene's Cement makes a pure white and permanent finish. There are two grades. Regular grade is used for wainscot, dado, moulding, in both rooms, halls and ornamental work. Fine grade is used mostly for artificial marble, scagliola, etc.

PLASTER OF PARIS.

SHIELD BRAND—Grey in color, but equal in working quality to white.

STANDARD WHITE—A strong, cool working plaster that makes a good finish.

IMPROVED PULPSTONE.

HARDWALL PLASTER—Pulpstone is a Wood Fibred Gypsum Plaster. Requires no addition of lime, sand, hair or other material. Ready for use by adding water. Sets in a few hours hard and solid and at the same time elastic. Good work can be done with one coat. The surface can be either troweled smooth for papering or tinting or floated to resemble ordinary stucco or sand finish.



GYPSUM BOARD, GYPSUM WALL BOARD, SIMPLEX SYSTEM OF STEEL STUDDING

GYPSUM BOARD.

A fire resisting, sound proof, vermin proof, permanent lathing material, made of a layer of Gypsum between two layers of porous paper. It forms a perfect plastering surface for Gypsum Plaster, eliminates buckling, warping, checking, cracking, lath marks and stains. Can also be used instead of wood sheathing and acts as a fire stop, insulator and sound deadener in roofs, floors and walls. It is the only fireproof board for finishing attics, basements and storerooms. When treated with tar or asphalt it makes a cheap and fireproof roofing of good wearing quality.

Size 32 x 36 x $\frac{3}{8}$ ". Weight 2 lbs. per sq. ft. Nails: We supply special nails required, $1\frac{1}{4}$ " x 11 ga., 7/16" head.

CAUTION—Never apply Lime Mortar to Gypsum Board.

SPECIFICATIONS.

SPECIFICATIONS FOR TWO-COAT PLASTERING ON GYPSUM BOARD—Plaster to be any brand of Ontario Gypsum Company's Hardwall Plaster. Mix 1 part Hardwall Plaster to $1\frac{1}{2}$ parts sharp sand by measure. Do not wet Gypsum Board before applying plaster. The bond between the plaster and Board is perfect. Apply scratch coat Hardwall Plaster over entire surface $\frac{3}{8}$ " thick. Follow this with white finish coat $\frac{1}{8}$ " thick of Hydrated Lime gauged with Plaster Paris in two or three days, or follow immediately with grey finish coat of Hardwall Finish. If the latter is used the wall can be plastered and finished in one day, saving time, labor and cost of scaffolding.

Gypsum Board can be finished with one coat of Gyproc Finishing Plaster. Fill cracks first and apply one coat of finish $\frac{1}{8}$ " thick. This is a cheaper and more satisfactory wall than wood lath and lime mortar.

SPECIFICATIONS FOR STUCCO ON GYPSUM BOARD FOR EXTERIOR WALLS—Nail Gypsum Board to studs at 16" or 18" centres with nails $1\frac{1}{4}$ " x 11 ga., 7/16" head every 4" on bearings. Over the Board apply 2" mesh, 16 ga. galvanized wire netting, properly stapled. Plaster with scratch coat $\frac{3}{8}$ " of Gypsum Hardwall Plaster in the usual manner. As soon as the scratch coat becomes stiff, but before it has time to set, apply a coat of cement stucco consisting of 1 part Portland Cement, 3 parts coarse sharp sand and one-quarter part Hydrated Lime, or an approved waterproofing compound may be used with one-tenth part Hydrated Lime. A bond is thus formed between the Gypsum Board, Hardwall Plaster and Cement Stucco, while the materials are in the process of setting, which would not be the case if the Gypsum Plaster was allowed to set hard before the Cement Stucco was applied. When the Stucco has had time to set hard, apply a third coat of Cement Stucco to be floated, pebbled or finished as desired.

GYPROC WALL BOARD.

"GYPROC" WALL BOARD is a large, strong sheet of pure Gypsum Rock. The Gypsum is moulded and compressed between two layers of tough paper, while still in a plastic form. After moulding the Gypsum re-crystallizes (returns to Rock.)

Gypsum is generally recognized as being the most efficient material for permanent, substantial walls and ceilings. It is easily and quickly nailed to wood studs with ordinary small wire nails.

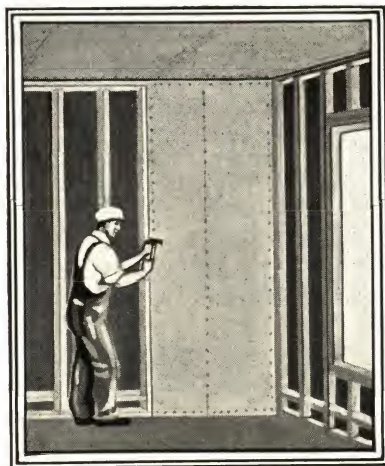
Width, 32 inches. Length, 4, 5, 6, 7, 8, 9, 10 feet.

USES:—"Gyproc" Wall Board forms a permanent wall without plaster. For partitions, re-modelling attic, cellar and out-buildings it is invaluable. Quickly and easily applied, readily cut with saw. We supply nails, tape for joints and crack filler.

ADVANTAGES:—Will not burn—the best insurance against fire. Won't warp, buckle, shrink or crack. Is strong and rigid, is quickly and easily applied. Can be painted or wall papered. Coldproof and heat proof. A perfect insulator, saves fuel. Resists sound. Is vermin proof.

This illustration gives you a good conception of the thoroughly high-grade construction you get when you decide to build with the Simplex System.

The staunch studs are securely anchored to floor and ceiling. Large, rigid slabs of Gypsum are placed in position between the studs and securely fastened every six inches by looping a die-cut section of the stud over a three-inch pin. Notice that the Gypsum Boards are placed in a staggered arrangement to gain additional strength through the "broken joints." Metal clips in the horizontal joints keep the boards in perfect alignment and prevent any play.



APPLYING GYPROC WALL BOARD.



A FIRM, LEVEL PLASTERING BASE

RESULT.

The result of this construction is a strong base with a smooth level plastering surface. Less plaster is required to produce a perfect finished wall, and the natural bond between the Gypsum Plaster and the Gypsum Board assures a lasting, crackless partition or ceiling.

Send for Booklet and full size details.

INTERNATIONAL VARNISH CO., LIMITED

MONTREAL.

HALIFAX.

TORONTO.

WINNIPEG.

VANCOUVER.

MANUFACTURERS OF

VARNISHES, STAINS, ENAMELS, PAINT, WHITE LEAD AND PUTTY.

A FULLY GUARANTEED PRODUCT TO SUIT EVERY FINISHING NEED.

It is impossible in the space at our disposal to give full working specifications covering all of our products; in fact, it would require a book the size of this one to do this properly.

What we want to do is to put before the architect, contractor, and painter a list of our principal architectural finishes with a few general remarks regarding their use. Then if a detailed specification is required for a particular finish, an inquiry addressed to our Service Department will elicit the fullest specifications and instructions for obtaining the finish desired.



FOR ALL
EXTERIOR
WORK.

For finishing front doors and all woodwork exposed to the weather, where greatest durability is requisite. Dries free from dust in eight to ten hours. Hardens sufficiently in about five days to permit of being rubbed. Possesses the maximum elasticity attainable in any varnish. Produces a beautiful lustre over natural, painted or grained woods, and may be rubbed with pumice-stone and water to a dull finish. ELASTICA No. 1 excels all other finishes or varnishes on the market for use on steamships, yachts, boats, canoes, spars, etc., effectually resisting the action of both fresh and salt water. Does not mar, scratch white nor spot. Resists atmospheric influences better than any other varnish, is water-proof and unaffected by hot or cold water.



FOR FINEST
INTERIOR WORK.

Extreme paleness and durability are distinguishing features of this varnish. It works with surprising freedom, covers the maximum surface area, and produces a brilliant, permanent gloss finish. Dries free from dust in four to six hours. May be rubbed to a dull finish in from three to four days.

Especially recommended and intended for finishing finest woodwork in palatial residences, apartments, bank, office and hotel buildings.



Combines quick and hard drying properties without sacrificing elasticity or durability in any degree, and protects floors under severest wear and frequent washing. Does not mar, scratch white nor spot. Works easily, dries dust free in four to six hours, hardens over night and can be rubbed. On grained, painted or old floors, linoleum or oil cloth, one coat is sufficient. Remove all grease and dirt from floors before applying. Reduce with turpentine when necessary. Do not apply Elastica Floor Finish over Shellacs, Liquid Fillers or patent "First Coaters."



"Kleartone" Oil Stains are labour-saving stains, requiring only one brushing operation. They penetrate as deeply as acid stains, but, unlike acid stains, do not require that the wood be sponged first or sandpapered after staining.

The shades are: Light Mahogany, Dark Mahogany, Extra Dark Mahogany, Brown Mahogany, Cherry, Walnut, Olive Green, Sage Green, Dark Forest Green, Light Brown, Dark Brown, Flemish Oak, Early English, Circassian Walnut, Dark Fumed, Light Fumed, Bog Oak, Dark Oak, Light Oak, Pollard Oak, English Oak, Golden Oak, Weathered Oak.

"Kleartone" Acid Stains are used to produce certain stained effects which are only obtainable with an acid stain. They are the most perfect of their kind, the colours being absolutely fast, and not injurious to the woods or succeeding finishing coats. The shades are: Silver Gray, Light Fumed Oak, Dark Fumed Oak, Light Mahogany, Dark Mahogany, Extra Dark Mahogany.

NOTE.—Do not use shellacs over Kleartone Stains. For permanent effects our Kleartone Sealers or Coaters must be used over our stains to secure the effects of our finished samples.

Any special shades can be matched, if sample be furnished for our guidance.



LIGHT AND
DARK.

"Kleartone" Sealers are prepared especially for use in conjunction with "Kleartone" Stains and insure correct results, clearness of tone and uniform lasting colour. They are of the proper consistency and should be used just as they come from the package. Do not sandpaper.

"KLEARTONE" SEALER (LIGHT).

"Kleartone" Sealer (Light) should be used over the following shades of "Kleartone" Stain:

Olive Green.	Flemish Oak.	English Oak.
Sage Green.	Early English.	Weathered Oak.
Dark Forest Green.	Bog Oak.	Circassian Walnut.
Light Fumed.	Pollard Oak.	Hague Oak.
Dark Fumed.		

"KLEARTONE" SEALER (DARK).

"Kleartone" Sealer (Dark) should be used over the following shades of "Kleartone" Stain:

Light Oak.	Dark Oak.	Golden Oak.
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"Kleartone" Mahogany Coater should be used over the following "Kleartone" Stains: Cherry, Mahogany, Walnut, Light and Dark Brown.

It is a thin alcohol coater, which enriches the colour of the stain and *positively prevents fading*. By the use of the above-mentioned stains and "Kleartone" Mahogany Coater, an effect is produced that is matchless and permanent.

"Kleartone" Silver Gray Coater is a thin, gray, spirit coater, which is especially intended for use over our "Kleartone" Silver Gray Acid Stain. It prevents the yellowness of the wood from showing through. It works easily, dries quickly, and can be sandpapered in a few hours.



Flat Varnish
FOR A RUBBED
EFFECT.

For use as a final coat where a rubbed effect is desired, without the labour and cost of rubbing. Is used over natural or stained woods, and produces a finish closely resembling a gloss varnish, rubbed. Particularly recommended for use over mahogany or mahogany stained woods, as it does not cloud same. "Kleartone" Flat Varnish applied as a final coat over "Elastica" No. 2 will produce an exceptionally good finish.

"Kleartone" Flat Varnish is unaffected by water, and, unlike most flat varnishes, does not contain wax or pigment. It does not need stirring and is exceptionally tough and elastic.



These Fillers are recommended for the filling of woodwork and flooring in public and private buildings, where open grain woods are used. They are made in a wide variety of shades, of the best and most adaptable raw materials, by experts in this line.

"Kleartone" Paste Wood Fillers will not shrink, and the finish applied over them will not "pit." They produce a perfect foundation for the succeeding coats of varnish.



Cabinet Finish

Is the one satisfactory pigment flat varnish. It dries hard over night, contains no wax, surfaces well, and produces an even "flat" or Mission Finish without rubbing.

"Flatine" Cabinet Finish has proved a very popular finish and is highly recommended.

For use where a Dead Flat or Mission effect is desired.

This product is a Pigment Varnish and must be thoroughly agitated before applying; the pigment will settle and care must be used to see that this varnish is properly agitated until the container is empty.



Is the immaculate finish of refinement, time tested and approved since 1834. It works freely under the brush, is quick drying, does not settle nor harden in the can, and will not skin; it is unequalled for obtaining a perfect enamel finish.

A surface finished with "Satinette" Enamel can be repeatedly washed without injury to the finish.

We are the sole Canadian Licensees of Pinchin, Johnson & Co., of London, England. Established 1834.

WHITE (GLOSS)—FOR EXTERIOR OR INTERIOR WORK.

Intended for use as final coats over a foundation surface prepared with "Satinette" Undercoat or Satinette Cement Undercoat. It will not turn yellow.

"Satinette" Enamel White (Gloss) produces a perfect gloss finish, which may be rubbed with pumice-stone and water to produce a semi-gloss finish.

WHITE (FLAT)—FOR INTERIOR WORK.

Produces a durable and smooth flat white enamel finish. Works freely under the brush, hardens quickly, and does not turn yellow.

It is intended for use as final coats over a foundation surface properly prepared with "Satinette" Undercoat or "Satinette" Cement Undercoat.

COLORS (GLOSS) FOR INTERIOR WORK.

"Satinette" Enamel is now produced in four beautiful tints. They are absolutely permanent and produce the very finest class of work. The tints regularly supplied are Ivory, Grey, Blue and Green, but other shades can be supplied when necessary on special order.

"Satinette" Enamel in Colors has all the good qualities that have been associated with this Enamel for the past eighty years and should be used wherever an especially harmonious decorative treatment is required.



Is used for the foundation coats on work to be finished with "Satinette" White Enamel. Its covering capacity is remarkable, and it flows out with surprising freedom, producing a satin-like surface, which requires only light sandpapering.

It dries quickly, hard and tough, and does not show brush marks. "Satinette" Undercoat is much superior to white lead in oil, as it will not affect the succeeding enamel coats. The success of an enamel finish depends upon the preparation of the foundation surface.



This material is a scientifically prepared product, solely for the purpose of preparing a suitable foundation on Cement, Concrete, Stucco, Keene's Cement, Plaster, Brick or Stone, upon which to apply "Satinette" Enamel, an enamel finish being so desirable on these surfaces in Hotels, Public Buildings, Hospitals and similar structures, both from the economical and sanitary standpoints.

"Satinette" Cement Undercoat is the result of exhaustive laboratory research, weather tests, and practical experience. It has a neutralizing effect and resists chemical action.

It has splendid working qualities and covering capacity. A gallon covers approximately 300 square feet, depending upon the porosity of the surface.

CANADIAN AGENCIES:
 MONTREAL—SEYMOUR & Co.,
 13 St. Nicholas Building.
 TORONTO—THE ANDREW MUIRHEAD CO.
 OTTAWA—McDOUGAL'S LIMITED.
 HALIFAX—FRANK A. GILLIS CO.
 QUEBEC—G. I. LACHANCE.
 VANCOUVER—HENRY DARLING.

SAMUEL CABOT, INC.
MANUFACTURING CHEMISTS,
BOSTON, MASS., U.S.A.

CANADIAN AGENCIES:
 WINNIPEG—BRAID & McCURDY.
 SASKATOON—BUILDING PRODUCTS
 AND FUEL LTD.
 CALGARY & EDMONTON—For Insulating
 and Deadening Quilt only:
 GORMANS LIMITED.
 CALGARY—For Shingle Stains only:
 McDONALD-BAKER CO.

PRODUCTS.

Inventors and sole manufacturers of CABOT'S "CREOSOTE" SHINGLE STAINS, Insulating AND DEADENING "QUILT," "CONSERVO" WOOD PRESERVATIVE, WATERPROOF BRICK AND CEMENT STAINS, DAMP-PROOFINGS, PROTECTIVE PAINT, ETC.

**CABOT'S
 "CREOSOTE"
 SHINGLE
 STAINS.**

The Cabot Stains are the original Creosote Stains invented by Samuel Cabot over thirty-five years ago, and the beauty and variety of their soft, artistic colouring effects has made the wide vogue of the shingled house possible. They have been used all over the world, and are acknowledged to be "the standard shingle stains."

They are beautiful, durable, preservative and economical, and are the only genuine Creosote Wood-preserving Stains.

**APPLICATION
 OF SHINGLE
 STAINS.**

The Stains are sold ready for use, and no thinning or adulteration should be permitted. The shingles can be dipped before laying, or the Stain can be applied with a brush after laying. Dipping more thoroughly preserves the shingles and prevents unstained wood from showing, if the shingles shrink after laying. Brush coating takes less stain but more labour. The colouring effect is about the same in either case. If applied with a brush, two coats should always be used, because one coat is not a thorough job in any material. After dipping, a brush coat on the laid shingles is worth while, as it takes but little stain, covers any raw spots, and adds to the durability.

STIRRING.—The Stains should be kept thoroughly stirred, and should be applied to dry wood to insure uniform and durable results.

**COVERING
 CAPACITY.**

One gallon to 100 sq. ft., two brush coats; $2\frac{1}{2}$ to $2\frac{3}{4}$ wine gallons to 1,000 shingles dipped two-thirds; 3 gallons for dipping and afterwards brush coating.

**SPECIFICATION
 FOR SHINGLE
 STAINS.**

Specify "Cabot's 'Creosote' Shingle Stains, in original packages bearing Cabot's trade mark. Colour to be selected by architect or owner." State whether shingles are to be dipped or brush coated, or both.

SAMPLES.

Samples on shingle cedar, showing all the regular colours, will be sent on request.

**CABOT'S
 OLD VIRGINIA
 WHITE.**

Gives a clean, brilliant "whitewash white" effect that has real distinction. A softer but brighter white than paint, and essentially different, having no "painty" look. As handsome as new whitewash and as lasting as paint.

**WATERPROOF
 STUCCO
 STAINS.**

Transparent Stains that delicately colour stucco and concrete without hiding the texture. Will not crack or peel, and rainproof. One gallon covers 100 to 250 square feet, two coats. All shades.

**WATERPROOF
 BRICK STAINS**

For colouring and waterproofing brickwork these Stains are vastly superior to paint, from either the artistic or practical standpoint. For evening up off-coloured and mis-matched brick, or restoring the colour of old, faded and discoloured walls, they are unequalled.

**CABOT'S
 DAMP-
 PROOFING.**

A permanent waterproof and adhesive coating for interior brick and concrete walls on which plaster can be laid directly without furring or lathing. It forms a perfect bond between wall and plaster. Also for stone, brick or concrete walls, above or below grade. Prevents staining of delicate stone. Elastic and permanent. One gallon covers 80 to 100 square feet, two coats.

**CABOT'S
 CLEAR
 WATER-
 PROOFINGS.**

Transparent waterproofings which penetrate into the pores of Brick or Cement and make the surfaces thoroughly and permanently rainproof. Applied with a brush to any brick or cement wall.

CABOT'S INSULATING AND DEADENING "QUILT."

PURPOSES.—For heat insulation in dwellings, cold stores, ice houses and all buildings where uniform temperature is desired, and for deadening sound in school houses, flats, hotels, hospitals, lodges, etc.

"QUILT" is a scientific non-conductor of both heat and sound. It consists of a matting of *cured eel-grass* (*Zostera Marina*) stitched between two layers of remarkably strong Kraft paper. The long ribbon-like fibres of eel-grass cross each other at every angle, and form within each layer of "Quilt" innumerable minute cells of "dead" air, making a soft, elastic cushion which is a wonderfully effective non-conductor. It is therefore not a mere felt or paper, but has a structure like a bird's plumage, that is, first a layer of matter, then a layer of dead air. These dead-air cells prevent the transmission of heat, and they break up and absorb sound-waves. One layer of "Quilt" is equal to more than forty of the cheap building papers.

DECAY AND
VERMIN-
PROOF.

UNIN-
FLAMMABLE.

WHY EEL-GRASS?—"Quilt" is made of eel-grass because that substance more perfectly meets the requirements than any other known. (1) It has a long, flat fibre, and when felted, as we use it, these ribbons form the successive air-spaces which give "Quilt" its chief power, and which would be impossible with a round fibre; (2) Eel-grass is indestructible by decay,* and because of its saline origin and percentage of Iodine is repellent to insects and vermin; (3) It will not burn, as it is composed of Silicon in place of the Carbon of plants that grow in the air, and is therefore an efficient fire-retardant; (4) It is very tough and never loses its elasticity.



OLD PIERCE HOUSE, DORCHESTER, MASS.
Built about 1635.

*The walls of the old Pierce House, Dorchester, Mass., were stuffed with eel-grass when the house was built, about 1635, and the grass is still in a perfect state of preservation. We have a sample of this 285-year-old eel-grass in our office, as here shown.



*Seaweed taken from the
Pierce House, Dorchester, Mass.
The house was built about 1635 and the eel-grass
was then distributed. It is now in the
C. B. Jones*

FAC-SIMILE OF LABEL ON BOTTLE SHOWN
ABOVE.



HOUSE
INSULATION.

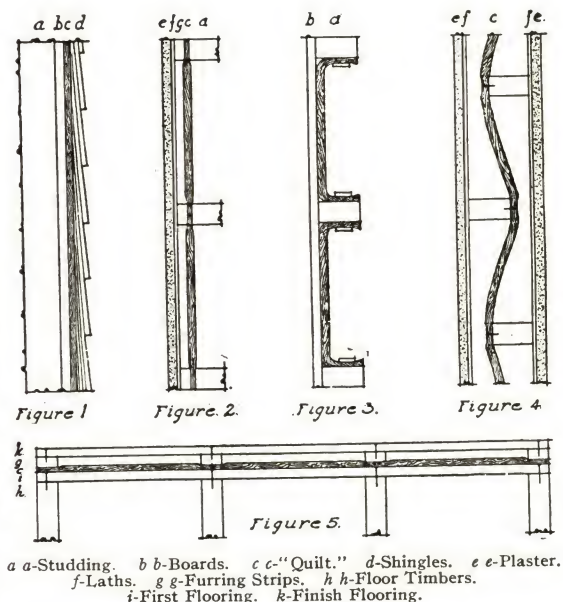


The above three houses stand side by side in Duluth, Minn. The largest one is insulated with Cabot's Quilt, and the two smaller ones with other products. One of the smaller houses used 42% more coal than the largest house, and the other used 70% more—proving the efficiency and economy of Cabot's Quilt.

"It is cheaper to build warm houses than to heat cold ones," and Cabot's Quilt will pay for itself in two winters in saving fuel, and will keep a house warm and comfortable for all time.

COLD
STORAGE
INSULATION.

Cabot's Quilt costs one-fifth as much as cork and equals it in efficiency, is more durable and a better fire resistant.



a a-Studding. b b-Boards. c c-"Quilt." d-Shingles. e e-Plaster.
f-Laths. g g-Furring Strips. h h-Floor Timbers.
i-First Flooring. k k-Finish Flooring.

Figs. 1 and 3 show methods of heat insulation in dwellings, etc. Figs. 2, 4 and 5 show methods of sound deadening in floors and partitions. Cold storage drawings on request.

STURGEONS LIMITED

PRESERVATIVES AND PAINT SPECIALTIES.

AGENTS:—

64-6 RICHMOND ST. EAST, TORONTO, ONT.

P. CAMPBELL & Co., St. John, N.B.; SPIELMAN AGENCIES, Montreal; (for Flintex) BEVERIDGE PAPER Co., Montreal; F. J. WALKER & Co., Winnipeg; WM. N. O'NEIL Co., LTD., Victoria and Vancouver.



Manufactured by Major & Co., Ltd., Hull, England.

This is a wood preservative made from heavy oil of coal tar. By distillation the light oils are eliminated, also tar acids which are so destructive to spikes, etc. It does not evaporate, thus an oil of strong antiseptic value is permanently deposited in the wood eliminating any chance of dry rot, fungoid growth, or bacteriological decay.

It is recommended to use:—

Hydro quality for all preservative work such as timbers set in concrete, piles, joists, etc.

Architectural Grade in browns, greens, reds and grays, for shingles, half timber work, fences, etc.

Interior Solignum is a beautiful stain supplied in browns, green and mahogany, recommended for all interior staining; it may be left in plain stain or wax or varnish finish. Solignum-lac should be used as a first coater over Solignum when varnish or wax is to be used for finish.



Manufactured in London, England.

This material is one of the finest enamels on the market and is made of the finest grade of zinc and lacquer. It is supplied in White Gloss, Semi-Gloss and Flat. Special deep colors imported on request. Tube colors are supplied for obtaining tints. It is particularly recommended to use Perfexcion undercoatings and we can guarantee results.

FLINTEX CONCRETE SPECIALTIES.

FLINTEX SURFACE HARDENER. This is a liquid hardener which makes old as well as new concrete floors dust, wear and water-proof. It unites chemically with the cement, filling the pores or voids so as to render the mass solid, compact and indestructible. It also protects against disintegration, acids and frost. Three applications as directed are recommended.

FLINTEX INTEGRAL WATERPROOFING. This is a powder used to water-proof foundation walls, swimming pools, boiler pits, tanks, etc. It unites with the cement to make the aggregate permanently waterproof and should be employed wherever water or dampness may be encountered. It must be mixed thoroughly dry with cement before putting into the concrete.

FLINTEX ACCELERATOR. This is a liquid which acts upon the cement in the aggregate so as to quicken the final set, simplify trowelling, increase the tensile strength, produce a hard surface, assist in waterproofing and prevent freezing. It is recommended for all concrete and cement mixtures. It is mixed with the water to be used in the aggregate.

STURGEONS FRENCH POLISH WAX.

This is manufactured by us from the finest grades of Beeswax and other hard waxes, reduced with pure Turpentine. This gives the splendid wearing qualities as well as the beautiful soft finish. This may be used directly on top of the Solpar Wood Filler without any undercoating between and a few applications will give the desired effect. We recommend its use particularly on floors, trim and furniture.

STURGEONS MILL WHITE.

This is manufactured from zinc, lithophone, etc., with a splendid hard wearing varnish which will stand the washing and hard wear of public buildings, offices, warehouses and schools. It is recommended to use Sturgeons Mill White Undercoating in bringing up the work; the finish may be had in either gloss or flat and it may be applied to any surface, plaster, brick, stone, woodwork or metal.

ROCKFACE WATER PAINT.

We recommend that Rockface for brick be used on any surface of brick, stone, concrete or similar material. The reputation of Rockface is second to none. It has been used on the latest factories of the T. Eaton Co. Ltd., Robt. Simpson Mail Order Building, etc. It will not rub off and becomes practically part of the base to which it is applied. It is the cheapest and best article for factories on the market.

FERROLASTIC METAL PAINT.

This is made by us here and we consider it to be the most honest paint on the market. Specification employed will be submitted on request.

PRATT & LAMBERT-Inc.

VARNISH MAKERS, BRIDGEBURG, ONTARIO. OFFICE AND FACTORY, 32 COURTWRIGHT STREET.

FOREIGN FACTORIES:

NEW YORK

BUFFALO

CHICAGO

PRODUCTS.

"61" FLOOR VARNISH, the "Hammer Test" Floor Varnish.
 "61" FLOOR VARNISH, Dull Finish.
 "38" PRESERVATIVE VARNISH, for the highest grade of inside work.
 "110" CABINET VARNISH, for general inside work.
 FULLCOTE INTERIOR VARNISH, a full bodied interior varnish.
 SPAR FINISHING VARNISH, for exposed or exterior work.
 FILTEX, a practical first coater.
 IMPERMALIN, an absolutely waterproof varnish for interior or exterior work.
 PALEST INTERIOR VARNISH, for use over white work or light coloured woods.
 DULKOTE, a preservative varnish which dries with a dull finish without rubbing.
 OIL AND ACID STAINS, in a variety of colours to produce every practical effect known to the finishing trade.
 PASTE FILLERS of every colour.
 VITRALITE, the Long-Life Enamel, for inside and outside work, in White and Tints.
 VITRALITE EGGSHELL, an eggshell enamel for a semi-gloss enamel finish without rubbing.
 VITRALITE ENAMEL UNDERCOATING, for the second and third undercoats of enamel work.
 VITRALITE CEMENT COATING, as a coating by itself or as undercoating for enamel on cement, brick, etc.
 LYT-ALL, a better industrial wall coating.

WHY THESE SPECIFICATIONS ARE OF VALUE.

The service which any suggested specifications can render the architect depends to a great extent upon the experience back of such recommendations.

On the subject of interior finishing, PRATT & LAMBERT-INC. occupy a position of unique importance and advantage. They were the first to enter the field of special architectural finishes, and the P & L Line has never been equalled for the beauty and variety of effects possible, or the durability of the finish.

SAMPLE PANELS AND SPECIFICATION BOOK SENT ON REQUEST.

We shall be glad to send you panels showing effects obtainable with Pratt & Lambert Stains, Fillers, and Varnishes, also copy of our Specification Book, compiled especially for Architects.

OVER SEVENTY YEARS' EXPERIENCE AT YOUR DISPOSAL.

The following specifications, of course, can give only in a general way the best methods to follow and the possible effects in the different kinds of finishing. Whenever, therefore, you desire any particular advice, information or suggestions, do not hesitate to ask us.

SPECIFICATIONS.

EXTERIOR WORK—

Open-Grained Woods—

- One coat of Paste Filler of desired colour.
- One coat of "61" Floor Varnish.
- Two coats of Spar Finishing Varnish.

Close-Grained Woods—

- One coat of Pratt & Lambert Oil Stain of the desired shade, if stained finish is desired. If not, stain is not required.
- One coat of "61" Floor Varnish.
- Two coats of Spar Finishing Varnish.

INTERIOR WORK—NATURAL—

Open-Grained Woods—

- One coat of Paste Filler.
- Three coats of "38" Preservative Varnish, left in gloss, rubbed dull or polished.

Close-Grained Woods—

- One coat of Filtex.
- Two coats of "38" Preservative Varnish, left in gloss, rubbed dull or polished.

ONE-TONE COLOUR EFFECTS—

Close-Grained Woods—

- One coat of Acid or Oil Stain.
- Over Acid Stain, one coat of pure shellac. Over Oil Stain, one coat of Filtex.
- Two coats of "38" Preservative Varnish, left in gloss, rubbed dull or polished.

Open-Grained Woods—

- One coat of Paste Filler of the required shade. If desired depth of colour cannot be obtained with the coloured paste filler, a coat of Acid Stain should be applied before the filler, followed when dry with a coat of Paste Filler of the same colour.
- Over Acid Stain and Paste Filler, one coat of pure shellac, two coats of "38" Preservative Varnish, left in gloss, rubbed dull or polished.
- Over Paste Filler only, three coats of "38" Preservative Varnish, left in gloss, rubbed dull or polished.

TWO-TONE COLOUR EFFECTS—

- One coat of Acid Stain.
- One coat of Shellac.
- One coat of Paste Filler, of a different colour than was the acid stain.
- One coat of Shellac.
- Two coats of Palest Interior Varnish or "38" Preservative Varnish, left in gloss, rubbed dull or polished.

NOTE.—Two-Tone Effects can only be procured on open-grained woods, such as oak, etc., and are produced by the combination of acid stains and a white or tinted paste filler of a different colour.

Example: For instance, the Pratt & Lambert Wood Finish Effect No. 7220 is a combination of a dark brown, English Oak Acid Stain and Special Green Paste Filler. A thin coat of white shellac is applied over the acid stain, which is applied first. After this, green filler is applied. This coat of shellac

TWO-TONE COLOUR EFFECTS—Continued.

allows the filler to "take" only in the porous parts of the wood, and the result is a beautiful combination of the brown and green.

DULL FINISH WITHOUT RUBBING—

Use the foregoing suggestions for specifications; substituting, however, one coat of Dulkote in every case where "38" Preservative Varnish, or Palest Interior Varnish is specified, and omit rubbing.

ENAMEL WORK—

Interior—Wood—

- One coat of lead and oil.
- Two coats of Vitralite Enamel Undercoating.
- Two coats of Vitralite Enamel, left in the gloss or rubbed.

Exterior Woodwork—

Use lead and oil instead of Vitralite Enamel Undercoating.

Eggshell or Dull Finish, Without Rubbing—

- One coat of lead and oil.
- Two coats of Vitralite Enamel Undercoating.
- One or two coats of Eggshell Vitralite Enamel.

INTERIOR AND EXTERIOR BRICK, CONCRETE AND STUCCO—

- One or two coats of Vitralite Cement Coating, the first coat reduced 20% with turpentine.
- One or two coats of Vitralite Enamel (Gloss).

INTERIOR PLASTER—

- One bond coat, consisting of one part Vitralite Enamel Undercoating, one part raw linseed oil and one part turpentine.
- One or two coats Vitralite Enamel Undercoating.
- One or two coats Vitralite Enamel (Gloss or Eggshell).

FLOORS—

Oak and All Open-Grained Woods—

- One coat of Paste Filler.
- Two or three coats of "61" Floor Varnish.

Maple, Pine and All Close-Grained Woods—

- Two or three coats of "61" Floor Varnish.

NOTE.—For Dull Finish apply one coat "61" Floor Varnish, Dull Finish, over two coats "61" Clear Gloss.

INDUSTRIAL WALL WORK—INTERIOR—

New Cement and Concrete Surfaces—

- One coat of Lyt-all Cement Coating.
- One coat of Lyt-all Gloss, Eggshell or Flat, as desired.

New Wood, Plaster and Brick Surfaces.

- One coat of Lyt-all Flat.
- One coat of Lyt-all Gloss, Eggshell or Flat, as desired.

Old White Painted Surfaces.

- One coat of Lyt-all Gloss, Eggshell or Flat, as desired.

Old Discolored or Dark Painted Surfaces.

- One coat of Lyt-all Flat.
- One coat of Lyt-all Gloss, Eggshell or Flat, as desired.

NOTE.—On very porous new surfaces, it may sometimes be necessary to apply an additional coat of the same material as is specified for the first coat. Mixing Filtext with the first coat of Lyt-all Flat is recommended for porous wood or plaster surfaces.

DOMINION PAINT WORKS, LIMITED

MONTREAL
QUEBEC
TORONTO
CALGARY
EDMONTON

MAKERS OF
DEGRACO PAINTS, VARNISHES, ENAMELS
WALKERVILLE, CANADA

WINNIPEG
HALIFAX
ST. JOHN
REGINA
VANCOUVER

SUPERIOR GRAPHITE PAINT It Prevents Rust

SUPERIOR GRAPHITE PAINT is especially designed to prevent rusting of metal surfaces and is as well a durable protective coating for wood surfaces where dark colors are suitable.

To really give service and protection, paints for structural steel should adhere firmly to the metal or other paint, should expand and contract readily with the metal, should be waterproof and unaffected by heat, cold, smoke, gases, etc.

SUPERIOR GRAPHITE PAINT in its various colors—natural, brown, black, red, and green—successfully meets all the above requirements. Its pigment base is inert amorphous graphite, and its liquid content is a specially prepared linseed oil vehicle of great durability.

SUPERIOR GRAPHITE PAINT is offered for the protection of structural steel, bridges, metal buildings, roofs, transmission towers, industrial plants and for metal surfaces of every character.

STA-WHITE MEANS THE DIFFERENCE

STA-WHITE is a pure white oil paint for industrial interiors—for the mill and factory walls and ceilings. Its great density, opacity and body, combined with exceptional spreading capacity and brushing qualities, make it a decidedly economical product.

Because of its permanent high gloss finish, STA-WHITE when soiled may be washed without injury.

STA-WHITE may be applied by either brush or spray methods. It flows freely under the brush and will not turn yellow, scale, crack or lose its gloss.

STA-WHITE is the mill white paint you can rely upon. Use it on walls, ceilings and columns of manufacturing rooms—in elevator shafts, stairways, light wells, offices, dressing rooms, toilets, etc.

Supplied also in egg-shell and flat finish if desired.

DEGRACO-TONE A FLAT WALL PAINT

DEGRACO-TONE is an oil paint in flat finish which gives the velvety artistic tone so much desired for walls and ceilings in offices, residences, theatres, churches, schools, hospitals, and other public or semi-public buildings.

DEGRACO-TONE is offered in a range of colors and shades that present unlimited possibilities for decorative effects. May be ordered in white for tinting.

DEGRACO-TONE when properly applied will not burn or peel off as it is proof against lime or alkali. Being an oil paint, it is washable.

In the application of DEGRACO-TONE there is no evidence of laps or brush marks, or the uneven finish that is so characteristic of lead and oil paints.

Should be applied over a coat of DEGRACO-TONE SEALER.

DEGRACO PAINTS VARNISHES ENAMELS

In addition to the above paints, the DEGRACO Line includes paints for practically every purpose, including:

House Paints and Varnish
Gas Holder Paint
Concrete Floor Hardener
Machinery Enamels
Wood and Iron Fillers
Pipe Joint Cement
Canvas Paints
Galvanized Iron Primer

Brick and Concrete Paints
Damp Proof Coatings
Acid Resisting Paints
Flat Machine Colors
Wood Preservatives
Boiler and Lubricating Graphite
Railroad and Marine Paints
Red Lead Paints

Literature and specifications on request.

BERRY BROTHERS, INCORPORATED

WORLD'S LARGEST VARNISH MAKERS,

WALKERVILLE, ONTARIO.

TORONTO OFFICE, 34 VICTORIA STREET.

LIQUID GRANITE.

THE VARNISH FOR FLOORS.—This is the most durable floor varnish made, combining the three principal requisites of a perfect floor finish—elasticity, durability and appearance. As a floor varnish it has never been equalled and there is more Liquid Granite in use to-day than any other floor varnish.

Specify as follows: Two coats of Liquid Granite applied over one coat of Berry Brothers' Paste Filler on open-grained woods; on close-grained woods omit the filler. Never use shellac or liquid fillers on floors that are to be varnished. If an under coat is wanted use Berry Brothers' Elastic First Coater.

LUXEBERRY WOOD FINISH LIGHT.

FOR GENERAL INTERIOR TRIM.—This is an Interior Varnish of the highest quality, and should be used in all specifications where the finest gloss or rubbed finish is required. It is full bodied, flows perfectly and dries with a full rich and durable finish. It is strongly recommended for all kinds of interior wood work, for offices, public buildings, hotels, or wherever the highest class of work is desired. It should be rubbed with pumice stone and water for a flat finish, and with pumice stone and oil if a soft velvety finish is desired (known as an egg-shell gloss).

Specify as follows: On open grain woods, one coat of Berry Brothers' Stain, one coat of Berry Brothers' Paste Wood Filler, one coat of Berry Brothers' S.D.C. White Shellac, and three coats of Berry Brothers' Luxeberry Wood Finish Light. On close grain woods omit the filler.

ELASTIC INTERIOR FINISH.

FOR INTERIOR TRIM SUBJECTED TO SEVERE USAGE.—Intended for interior work subjected to severe exposure or usage. It possesses great elasticity and durability, and will resist the action of hot water, soap, etc., to a greater degree than any other varnish.

Specify as follows: On open-grained woods, one coat of Berry Brothers' Stain, one coat of Berry Brothers' Paste Wood Filler, one coat of Berry Brothers' S.D.C. Shellac, and two coats of Elastic Interior. On close-grained woods omit the filler.

LUXEBERRY SPAR VARNISH.

FOR FRONT DOORS, STORE FRONTS AND SUCH EXTERIOR WORK AS IS SUBJECTED TO SEVERE EXPOSURE AND CHANGING WEATHER CONDITIONS.—This material is the standard of quality in a spar varnish, and has a reputation nearly sixty years old. This varnish is made especially for use on all types of marine architecture wherever a durable and lasting finish is desired. It can be used as both an exterior and interior varnish, as it is made to withstand severe wind, weather and water exposure and does not turn white.

Specify as follows: Two coats of Luxeberry Spar Varnish, over one coat of Berry Brothers' Paste Wood Filler on open-grained woods. Omit the filler on close-grained woods. Last coat can be rubbed if desired.

BERRY BROTHERS' CEMENT COATING.

Berry Brothers' Cement Coating is a sanitary preservative coating for all cement and concrete surfaces, excluding dirt and preventing chipping and the formation of dust caused by friction; makes a hard glossy finish and can be rubbed if desired.

We make Cement Coating in colours and transparent, and solicit inquiries from any one interested in a handsome, healthful and economical finish on cement and concrete surfaces.

BERRY BROTHERS' FLOOR WAX.

FOR INTERIOR WAX FINISH.—A new combination of hard waxes, especially adapted for finishing purposes. Easy to apply. Makes a hard finish. Will not soften after applying.

Directions for Use.—Open-grained woods like Oak, Chestnut, Ash, etc., should be first filled with Berry Brothers' Paste Filler.

Allow the Filler at least 24 hours to harden and then apply a coat of floor wax with a rag. Let it remain a few minutes, then use a long-handled weighted floor brush to bring up the finish.

It is well to rub the floor with the grain and then across the grain to get the best results.

A final rubbing with a soft dry cloth improves the finish.

In waxing old worn floors that have been finished with varnish or shellac, clean the surface well with turpentine and then use the wax as directed above, omitting the filler coat unless the floor is badly worn in places.

Close-grained woods like Maple, Pine, etc., do not need filling.

DULGLOSS.

FOR INTERIOR TRIM WORK WHERE A FLAT VARNISH IS DESIRABLE.—This material produces in one coat an imitation rubbed effect over shellaced or varnished surfaces. It is light in colour, flows freely under the brush, dries dust-free in about an hour and hardens in twelve hours with a soft velvety finish.

Specify as follows: For imitation waxed effect—one coat of Berry Brothers' Stain, one coat of Berry Brothers' Paste Wood Filler, one coat of Berry Brothers' S.D.C. Shellac and one coat of Dulgloss.

For imitation rubbed effect—one coat of Berry Brothers' Stain, one coat of Berry Brothers' Paste Wood Filler, one coat of Berry Brothers' S.D.C. Shellac, two coats of Luxeberry Wood Finish and one coat of Dulgloss.

On close-grained woods omit the filler.

LUXEBERRY WHITE ENAMEL.

FOR BATHROOMS AND BEDROOMS.—This enamel is especially designed for the practical finisher and decorator. It possesses full body, flows very freely and dries without showing brush marks. It will rub perfectly and can be polished to a piano finish. It can be used on the finest interior or furniture work. It is pure white in colour and stays white. If an egg shell gloss or imitation rubbed effect is wanted we will furnish it at the same price as the high gloss goods.

Note.—We can also furnish ivory, rich cream, London grey, true blue, cherry red, and sultan green when desired.

LUXEBERRY ENAMEL UNDERCOAT

Especially designed for use under Luxeberry Enamel. It is much better than a zinc coat, and holds up the Enamel coat perfectly.

Specify as follows: Apply one coat of pure White lead, mixed with equal parts of Linseed Oil and pure Turpentine to a brushing consistency. Follow with two coats of Luxeberry Enamel Undercoat. In using Luxeberry Enamel in colors, the Undercoat should be tinted to match or approximate the color of the enamel to be used. Allow each coat time to dry 36 to 48 hrs. and sand each coat lightly with 00 sand paper.

Dust off and apply two coats of Luxeberry Enamel, sanding lightly between coats with 00 sand paper, taking care that the first coat is thoroughly dry before applying the second.

The last coat can either be left in the natural gloss or rubbed as may be desired.

For a dull finish, rub the last coat when hard with pulverized pumice stone and water with a piece of felt or burlap.

If necessary to reduce the Undercoat, thin with turpentine.

SHINGLETINT.

FOR HALF-TIMBERED WORK OR SHINGLE STAIN SPECIFY "SHINGLETINT."—"Shingletint" represents the highest results yet attained in the manufacture of shingle stains. It possesses great penetrative and preservative qualities, being a scientific combination of colours finely ground in pure linseed oil, creosote oils and the necessary drying agents. It prolongs the life of the shingles by retarding decay, at the same time imparting a very artistic finish.

FACTS WORTH REMEMBERING.

All open-grained woods such as Oak, Ash, Chestnut, etc., should be filled with Berry Brothers' Paste Filler to match the colour of the wood or to match the colour of the stain if the wood is stained.

Close-grained woods such as Pine, Maple, Gumwood, etc., need no filling, but a first coat of Berry Brothers' S.D.C. Shellac is desirable and is especially so on Pine. The shellac coat should be applied directly to the wood and then finished in the natural colour and should follow the staining when the wood is stained.

The use of liquid fillers is not desirable for high grade work and should never be used on floors.

SPECIAL NOTE.

If you want to see samples of wood finished up in any particular way;

If you want advice as to the use of varnish, or on the treatment of woods to get the best results in the way of a finish;

If you are in doubt on any matter concerning varnish or its uses, or on the subject of wood finishing in any of its phases—

ASK BERRY BROTHERS.



LOWE BROTHERS, LIMITED
 PAINT MAKERS, VARNISH MAKERS,
 263-269 SORAUREN AVENUE,
 TORONTO, ONT.



DISTRIBUTORS: MACKENZIE BROS., LIMITED, WINNIPEG, MAN.

MELLOTONE.

"Soft as the
Rainbow Tints."

A flat finish for Interior Decoration of walls, ceilings and woodwork, producing a sanitary, washable velvet finish that is restful to the eye and appealing to a refined taste. Plaster, Burlap and Wall Board should be primed with Lowe Brothers' Sealcote mixed with "Mellotone" in the proportion of three quarts of Sealcote to one or more quarts of "Mellotone." Woodwork should be primed with one coat of "High Standard" Liquid Paint thinned with turpentine and used according to directions then allowed at least forty-eight hours to dry and harden before applying "Mellotone."

When desired, the finishing coat can be frescoed, picked out in gold, embellished in relief or otherwise. Mellotone is made in the following colors:

	IVORY TINT 695		LIGHT TAN 619
	CREAM TINT 612		GOLDEN YELLOW 696
	ROSE TINT 610		DARK TAN 620
	BLUE TINT 611		BROWN 618
	GRAY TINT 661		DARK GRAY 662
	GREEN TINT 613		NEUTRAL GREEN 614
	OLIVE GREEN 615		CRIMSON 617
	DARK GREEN 616		DELFT BLUE 621

Also WHITE 622

Also BLACK 623

PUBLICATIONS.

"High Standard Paint Specifications" (a book of forms)—"Hints to Architects"—"Paint and Painting"—"Protective and Preservative Paint"—"Test by Technologists"—"Architects' Mellotone Combinations," and "Common Sense About Interiors;" also color cards of each product, giving details of the best methods of usage. These may be secured without charge upon request.

SPECIAL PORTFOLIO.—"The House, Outside and Inside," containing eighteen beautiful color plates with complete description for obtaining similar effects, and booklet "Homes Attractive."

LOWE BROTHERS, LIMITED

STRUCTURAL IRON PAINT,

263-269 SORAUREN AVENUE,
TORONTO, ONT.

DISTRIBUTORS: MACKENZIE BROS., LIMITED, WINNIPEG, MAN.

"At one time paintmaking was an art, then it became a trick, now it is a science."

GENERAL.

Each architect is interested in securing for the steel fabric or other metal work under his supervision the best coating possible for present and future results. To prepare such a paint requires knowledge, experience and willingness to put money into the products. The Principals of Lowe Brothers, Limited, have had sixty years of experience. Its experts have kept themselves abreast of the most advanced knowledge and experience in manufacturing requirements and the performance of preservative and protective coatings for all materials of modern building.

DESIRABLE FEATURES OF AN ANTI-CORROSIVE METAL COATING.

1. It should hide the surface.
2. Should cement itself together, and also cement itself to either damp or dry metallic surfaces.
3. Should expand and contract without breaking its own body.
4. Should present a hard, yet tough, outer surface.
5. Should be impervious to water, carbonic acid, or other gases.
6. Should be unaffected by sunshine, heat, frost, dew or climatic changes.
7. Should be unaffected by ordinary mechanical abrasion.
8. Should wear evenly.
9. Should fail by gradual wear, not by disintegration.
10. Should leave a good surface for repainting.
11. Should not require an unreasonable amount of skill or muscle in application.
12. Should be homogeneous.
13. Should dry fast enough.
14. Should not be readily ignited.
15. Should have power to absorb and remove moisture or dampness from the metal.
16. Should have properties that will prevent corrosive action of traces of water in contact with the metal.

(Quoted from "Paints for Steel Structures," by Mr. Houston Lowe. Published by John Wiley & Sons, New York.)

"Paintmaking has been rescued from the domain of empiricism and has become an exact science. One skilled in it can now practice it with a certainty of results, in an exact proportion to his knowledge of its principles, and to his ability in applying them to work in hand."

RED LEAD LUTE.

Red Lead Lute is designed upon the theory that undercoats should dry more quickly and harder than those above them; that the difference in drying between adjoining coats should not be very great; that priming coats should be of a preservative nature, and that finishing or topping paints should be of a protective nature—that is, the priming coat should prevent oxidation of the metal, and the finishing coats should protect the preservative or foundation coating from the action of rainfall, sunshine, or special exterior conditions.

Iron and steel do not rust in dry air or in water free from air and carbon dioxide; but these conditions never obtain in practice.

Several applications of paint, known as coats, are usually necessary to secure a solid appearance, and to form a layer of sufficient thickness to keep moisture away from the metal and to protect it from rust for a certain time. The first or priming coat upon any surface in fit condition to receive paint is of the greatest importance, especially as to its drying, hardening and binding properties.

METALCOTE.

Metalcote is black in colour. The pigment portion has been compounded from materials recognized as the best for a preservative and protective coating. Manufacturers do not all agree as to what pigments are best for a coating of this kind, but a recent five-year test of all the various pigments entering into the manufacture of a paint for metal surfaces, and of paints containing various proportions of some of these pigments, proved that Lowe Brothers Metalcote contained the correct proportions of the proper pigments, as the paint, after five years' wear, received the highest rating given to any paint, regardless of its class.

The easy working properties of Metalcote are remarkable when we consider the fact that it dries in a short time with firm yet elastic coating.

SPECIFICATIONS.

SHOP COAT.—Before assembling, each surface, together with all bored holes, rivet heads and bolts, shall receive a coating of Lowe Brothers Red Lead Lute. After assembling, the steel shall be cleaned, and it shall then be given a coating of Lowe Brothers Red Lead Lute, and all small openings that will retain moisture shall be filled up with Lowe Brothers Red Lead Lute.

HANDLING AND TRANSPORTATION.—The metal shall be housed and cared for until the Inspector decides that the paint applied, as specified under previous sections, is sufficiently dry to be in fit condition for transportation. It is understood that at no time after the first coating of paint has been applied shall the metal be laid upon the bare ground, but that it shall be placed upon skids or trestles. In the transportation of this metal, the parts shall be so loaded and handled that the paint will not be subject to unnecessary abrasion.

FIRST FIELD COAT.—After erection, the metal shall be inspected; and if rusty spots are found, these shall be cleaned and reprimed with Lowe Brothers Red Lead Lute; the exposed edges and angles must then be painted with the same paint, at least an inch from the edge on each side, and the under and inner sides of girders, bolt heads, nuts, rivets, etc., shall have an extra coat to prevent the incursion of water; when this is dry, the entire surface shall receive a final coat of Red Lead Lute.

FINAL COATS.—The work shall be finished with one or more coats of Lowe Brothers Metalcote.

PUBLICATIONS.

Which will be mailed on request.

"High Standard" Paint Specifications (a book of forms).

"Protective and Preservative Paint."

"Test by Technologists."

Colour Cards of all Products, giving details of the best methods of usage.

"Paints for Steel Structures," by Houston Lowe (Published by John Wiley & Sons, New York City).

S. C. JOHNSON & SON, LIMITED

MANUFACTURERS OF ARTISTIC WOOD FINISHES

BRANTFORD, CANADA

PRODUCTS.

JOHNSON'S ARTISTIC WOOD FINISHES, INCLUDING: PERFECTONE UNDERCOAT, PERFECTONE ENAMEL, GLO-COAT ENAMEL, WOOD DYE, PREPARED WAX, FLAT VARNISH, FLOOR VARNISH, FINISHING VARNISH, PASTE WOOD FILLER.

SLOGAN.

"The Wood Finishing Authorities."

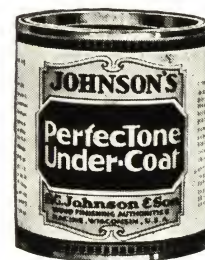
QUALITY OF JOHNSON'S ARTISTIC WOOD FINISHES.

In wood finishes you get just what is paid for. If cheap brands are bought you may be sure they are manufactured from cheap raw materials by cheap labor, and that the completed job will be a disappointment and the finish will not stand up.

If Johnson's Artistic Wood Finishes are specified then your clients will be assured of perfect results—a thrill of pleasure when the work is new, and yearly satisfaction in its wearing qualities.

JOHNSON'S PERFECTONE UNDERCOAT.

Johnson's Perfectone Undercoat is the perfect foundation for an enameled job; it is elastic, durable, non-porous, has great covering power, works freely under the brush and dries hard in from 18 to 24 hours. It will not run, sag, lap, chip, check, crack or peel. Has wonderful smoothness and opacity and will not absorb the enamel. Specify Johnson's Perfectone Undercoat as a primer on bare wood in lieu of lead and oil. It is non-poisonous, smoother, dries faster, and has greater opacity. Made in White, Ivory and French Gray.



JOHNSON'S PERFECTONE ENAMEL.

Johnson's Perfectone is the perfect architectural enamel. It is long in oil and gives a beautiful, porcelain-like finish which will not fade, chip, crack nor peel. Like porcelain, it will stand repeated washings. Cleaning has no harmful effect, neither dimming the gloss nor causing discoloration. Johnson's Perfectone Enamel is made in high Gloss in White only; and in Satine, in White, Ivory and French Gray. It works freely under the brush and any workman can apply it with splendid results.



JOHNSON'S GLO-COAT ENAMEL.

Johnson's Glo-Coat Gloss Enamel is splendid for new work and just the thing for a re-finishing job where you want quick work. Glo-Coat Enamel dries dust-proof in 5 to 6 hours, and hard in 24 to 36 hours. It produces a brilliant finish which will withstand repeated washings. Can be left in its original state or rubbed, as desired. Does not turn yellow, neither will it chip, crack or peel, owing to its elasticity and hardness.



JOHNSON'S WOOD DYE.

Johnson's Wood Dye is for the artistic coloring of wood. With it inexpensive soft woods such as pine, cypress, fir, etc., may be finished so that they are as beautiful as hardwood. Johnson's Wood Dye is very easy to apply—it goes on easily and quickly without a lap or a streak. Johnson's Wood Dye penetrates deeply, bringing out the beauty of the grain without raising it in the slightest—dries in 4 hours and does not rub off or smudge. Made in 14 shades, all of which may be easily lightened or darkened to suit the taste of your client.



JOHNSON'S PREPARED WAX.

Johnson's Prepared Wax is the proper finish and polish for floors of all kinds—wood, tile, marble, composition and linoleum. It does not show scratches or heel prints, and floors polished with it can easily be kept in perfect condition. Worn spots can be rewaxed without going over the entire floor. Johnson's Prepared Wax is splendid for protecting and preserving varnished floors—it forms a thin, protecting film over the varnish similar to the service rendered by a piece of plate glass over a desk.



JOHNSON'S FLAT VARNISH.

Johnson's Flat Varnish gives that beautiful, artistic, hand-rubbed effect without the expense of rubbing. It gives unqualified satisfaction on new work over Johnson's Wood Dye or Paste Wood Filler, and on old work, over old finish of all kinds. Johnson's Flat Varnish imparts a perfectly flat, artistic finish of great beauty and durability. It has enough body so that it may be rubbed if desired.



JOHNSON'S FLOOR VARNISH.

Johnson's Floor Varnish gives a beautiful, high gloss which will not mar, blister or scratch white. It is tough, elastic and durable—has good body—is absolutely waterproof and will stand all reasonable tests. It is pale in color so can be used on the lightest floors and linoleum. It will prove equally satisfactory on trim. Johnson's Floor Varnish is of the same high quality as Johnson's Floor Wax which is known all over the civilized world.



JOHNSON'S FINISHING VARNISH.

Johnson's Finishing Varnish is for use on interior trim requiring a high gloss, rubbed or polished finish. It can be rubbed with pumicestone and water, or pumicestone and oil after drying 24 to 36 hours. Is easy to apply. Johnson's Finishing Varnish gives a beautiful high gloss—dries dust free in 4 hours and hard overnight—works easily and has great elasticity. Will not chip, check, crack or peel.



JOHNSON'S PASTE WOOD FILLER.

For filling the grain and pores of all wood, preparing it for the ultimate finish. It is made from pure linseed oil, the best japan dryer of finely ground metronite quartz from our own mine. Johnson's Paste Wood Filler will remain usable indefinitely after thinning, and may be wiped with ease in from 15 minutes to 6 hours after application. One coat of wax or varnish over Johnston's Paste Wood Filler will give better results than 2 coats of varnish over liquid filler or on the bare wood.

SPECIFICATIONS.

FOR FINISHING NEW WOODWORK—*For high gloss enamel finish*, specify 2 coats of Johnson's Perfectone Undercoat and 2 coats of Johnson's Perfectone Gloss Enamel.

For a rubbed enamel finish, specify 2 coats of Johnson's Perfectone Undercoat and 2 coats of Johnson's Perfectone Satine Enamel.

For a natural finish on oak, chestnut and other open grained woods, specify 1 coat of Johnson's Natural Paste Wood Filler No. 10—and 2 coats of Johnson's Prepared Wax, or 2 coats of Johnson's Finishing Varnish.

For a natural finish on soft wood, specify 2 coats of Johnson's Finishing Varnish on the bare wood, or 1 coat of Johnson's Finishing Varnish and 1 coat of Johnson's Prepared Wax.

For stained effects, such as golden oak, mission, mahogany, walnut, etc., specify a coat of Johnson's Wood Dye, the desired shade on the bare wood, 1 coat of Johnson's Under-Lac, then 1 coat of Johnson's Prepared Wax, or 1 coat of Johnson's Finishing Varnish, or 1 coat of Johnson's Flat Varnish.

FOR FINISHING THE WOODWORK AND WALLS OF KITCHENS, PANTRIES, BATH ROOMS—Specify 2 coats of Johnson's Undercoat and 2 coats of Johnson's Glo-Coat Gloss Enamel. This will give a fine, smooth, high gloss, glasslike, germproof finish which can be freely washed without injury to the gloss, color or finish.

FOR FINISHING HARDWOOD FLOORS—*For a natural finish*, specify 1 coat of Johnson's Natural Paste Wood Filler No. 10 on the bare wood. Then 2 coats of Johnson's Prepared Wax, or 2 coats of Johnson's Floor Varnish.

For dark or golden oak effects, specify Johnson's No. 30 Dark Oak Paste Wood Filler or No. 20 Golden Oak Paste Wood Filler—then 2 coats of Johnson's Prepared Wax, or Johnson's Floor Varnish, depending on whether waxed or varnished floors are desired.

For other shades, such as mission, mahogany, walnut, etc., specify 1 coat of Johnson's Wood Dye, the desired shade, and 1 coat of Johnson's Under-Lac, then 2 coats of Johnson's Prepared Wax, or Johnson's Floor Varnish.

FOR FINISHING SOFT WOOD FLOORS—*For a natural finish*, specify 1 coat of Johnson's Floor Finish No. 1 and then 1 coat of Johnson's Prepared Wax or 1 coat of Johnson's Floor Varnish.

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FOR FINISHING KITCHEN, PANTRY, BATHROOM AND OTHER FLOORS WHICH REQUIRE WASHING—Specify 1 coat of Johnson's Natural Paste Wood Filler No. 10 and Johnson's Floor Finish No. 1. Subsequent coats of Johnson's Floor Finish No. 1 may be applied as required without removing the first coat.

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Architects are requested to write for our beautiful color book, "The Proper Treatment for Floors, Woodwork and Furniture," and also for our \$2.00 Portfolio of Wood Panels. We gladly furnish both free and postpaid to interested architects.

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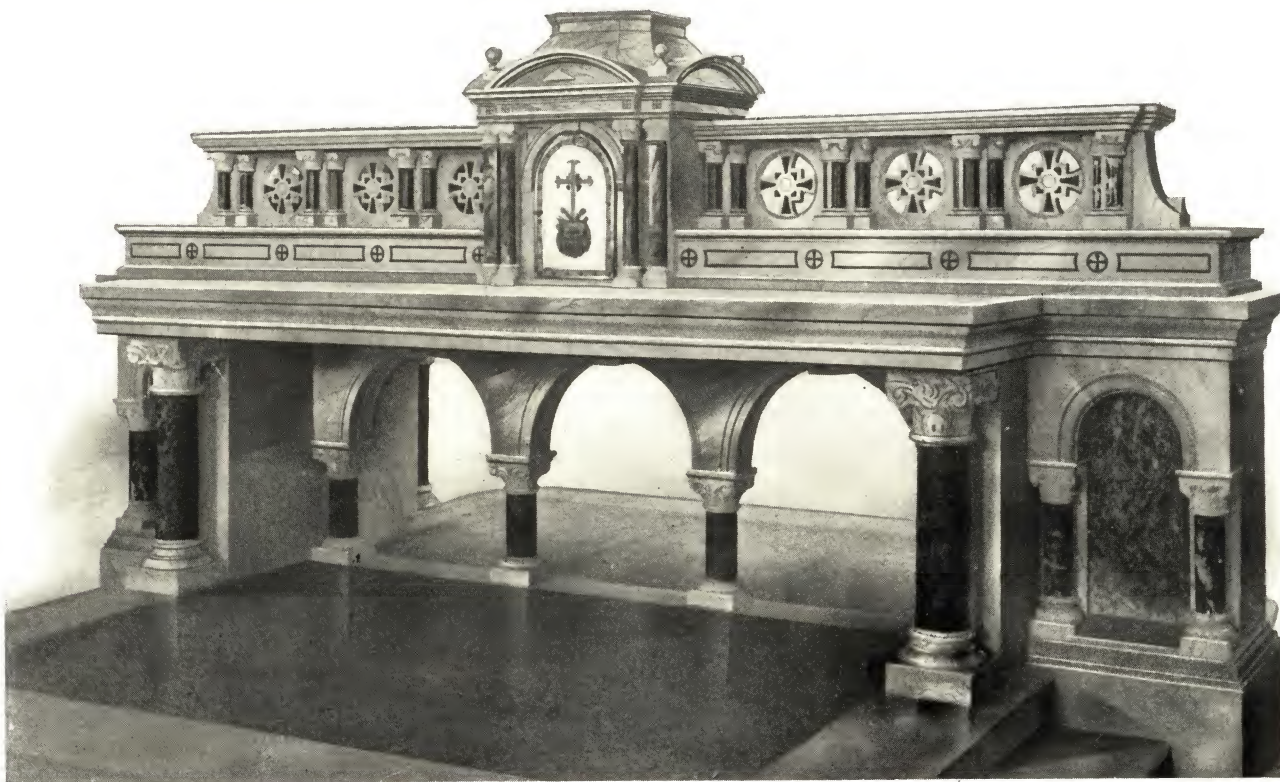
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Power Building . . .	Montreal, Que.	Mappin & Webb Store . . .	Montreal.
McDonald College . . .	St. Anne, Que.	Bank of Toronto . . .	Montreal (St. James St.).
Lake of Woods Building . . .	Montreal, Que.	Sun Life Bldg. . . .	Montreal.
Bank of Montreal . . .	Montreal, Que. (Peel St.).	Loew's Theatre	Montreal.
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Chateau Laurier	Ottawa.	Drummond Apartments . . .	Montreal.
Great West Life (Interior) . .	Winnipeg, Man.	Bank of Hochelaga (St. Cath- erine Street Branch) . . .	Montreal, Que.
Labelle Building	Montreal.	Salada Tea Building . . .	Montreal, Que.
Molsons Bank	St. Thomas, Ont.	Capitol Theatre	Montreal.

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ARCHITECTS: ESENWEIN & JOHNSON, BUFFALO.

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Marble Mosaic and Terrazzo Floors are artistic in appearance, durable in wear, and sanitary in effect, and cheaper in comparison with all other floors.

Rich soft colours,, permanent materials, sanitation, and moderate cost are the qualities that make Mosaic floors superior to all others.

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Partial list of Buildings in which the Italian Mosaic and Marble Co. of Canada, Ltd., have executed designs and work:

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London Sanatorium, London, Ont.
King Edward Hotel, Toronto, Ont.
Knox College, Toronto, Ont.
Toronto General Trust Bldg., Toronto, Ont.
Royal Bank Building, Toronto, Ont.
Methodist Book Room, Toronto, Ont.
15 Public Schools, Toronto, Ont.

St. Augustine Seminary, Toronto, Ont.
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Child's Restaurants, Toronto, Ont.
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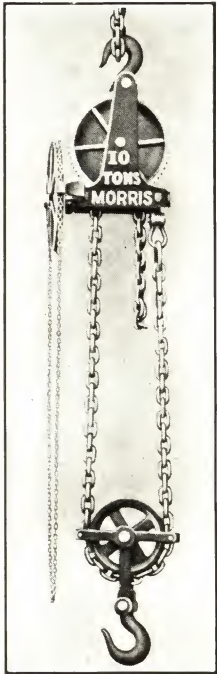
Bank of Commerce, Windsor, Ont.
Merchants Bank, Niagara Falls, Ont.
Merchants Bank, Georgetown, Ont.
Technical Art School, London, Ont.
Sarnia School, Sarnia, Ont.
Ford School, Ford, Ont.
Byron Sanitarium, London, Ont.
Rosedale Military Hospital, Toronto, Ont.
Christie St. Military Hospital, Toronto, Ont.
Canadian Westinghouse Bldg., Hamilton, Ont.
Acadia Coal Co., Ltd., Stellarton, N.S.
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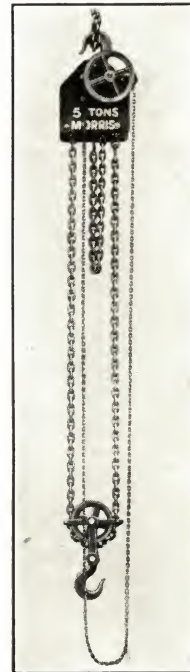


B. 265

Morris Lifting Machinery has spread its fame during the last four decades to every corner of the world. Morris Hoists have voyaged in the sturdy oaken hulls of the Arctic explorer, they have followed the toilsome trail over the Andes by pack-mule, and into mysterious Thibet they have also found their way. In civilized countries as well as in remote places, wherever the operation of trade and industry involves the raising or moving of large or small loads, the name MORRIS stands first for Service, Safety, Economy, Durability, Efficiency and Character.

The essence of these forty years of experience, research and big-scale production is at your service. If your problem is one of handling materials we shall be only too pleased to help you work it out effectively and economically.

Our new catalog of portable hand and electric hoists is just off the press. Special bulletins describe and illustrate our other lines of manufacture, including traveling blocks, runways, trolleys, cranes, telescopic ash hoists, slings, tripods, electric cranes and electric trolley-hoists. Our sales engineers in Toronto, Hamilton, or Montreal, and our engineering department at our Head Office, will be glad to serve you upon request.



B. 266



B. 402 GARAGE LIFTING EQUIPMENT



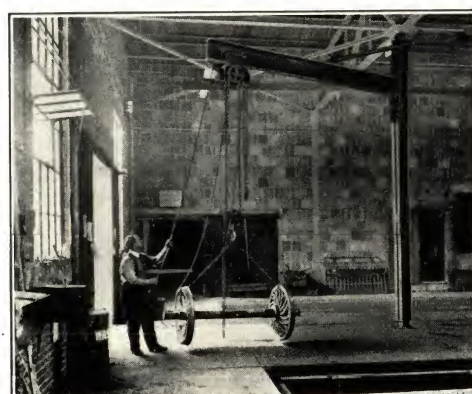
B. 401 OVERHEAD RUNWAYS



B. 406 WALL-TYPE JIB-CRANE



B. 405 TRAVELING GANTRY CRANE



B. 407 POST-TYPE JIB-CRANE



B. 403 PENT-HOUSE CRANE



GILLIS & GEOGHEGAN

MANUFACTURERS OF
G & G TELESCOPIC HOISTS,
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PATENT DATES.

Dominion of Canada.
April 19, 1912.
May 14, 1912.
December 9, 1913.
April 7, 1914.
Re-issued
November 14, 1916.
April 27, 1915.
June 22, 1915.
August 3, 1915.
May 9, 1916.
July 25, 1916.
September 5, 1916.
October 10, 1916.
November 21, 1916.
June 1, 1920.
August 31, 1920.

Other Patents Pending.

PRODUCTS.

Equipment for handling ashes, rubbish and other materials between floors, consisting of several models of HOISTS and other articles as follows:

MODEL E. HOIST OPERATED BY ELECTRIC MOTOR, with Automatic Stop and Gravity Lowering device.

MODEL D. OVERHEAD CRANE HOIST, with electric motor in cellar.

MODEL C. HOIST, with electric motor in cellar.

MODEL B. OVERHEAD CRANE HAND POWER HOIST, with Automatic Gear Shifting Brake Device and Silencer.

MODEL A. HAND POWER HOIST, with Automatic Gear Shifting Brake Device and Silencer.

G & G Flush Watertight Sidewalk Doors (checkered steel and vault light), G & G Automatic Sidewalk Door Opening and Closing Device, G & G Spring Guard Gates. G & G Swing Bail Ash Cans, G & G Operator's Ladder. G & G Electric Warning Bell, G & G Ash Can Truck.

NOTE:—It is recommended that COMPLETE equipment be installed as a unit, but if desired, any part or parts thereof can be furnished separately;

USES.

G & G Telescopic Hoists with Complete Equipment are designed for lifting and lowering loads up to 500 lbs. in industrial plants, and for ash removal in office buildings, schools, factories etc. Can be operated in the coldest weather as no parts are susceptible to freezing. G & G Hoist Equipment complies with all municipal ordinances.

MODEL "E" TELESCOPIC HOIST WITH ELECTRIC MOTOR (ONE-MAN MODEL).

The G & G Model "E" Telescopic Hoist with Complete Equipment operates electrically, and affords a simple, safe and economical method for hoisting and lowering between cellar and sidewalk, or between floors, such loads as ashes, rubbish, bags, bales, barrels, coal, garbage, ice, trays, etc. Fig. 1 shows Hoist equipment as installed for ash removal. When not in use no part of Hoist shows above sidewalk. A few turns of telescoping handle raises hoisting head to proper position over hoistway (Fig. 2). Operator then ascends to sidewalk level by the iron ladder, and proceeds to raise the cans. Hoisting head revolves on ball bearings, depositing can, without lifting, on sidewalk. Hoist is equipped with automatic upper limit, and LOWERS BY GRAVITY—thus consuming only HALF the usual amount of current, and permitting very rapid lowering speed. Electric control lever has three positions and automatically returns to "neutral" when pressure is released. At one extreme, load is raised by electric power, at the other extreme load is lowered by gravity, and in centre position load is brought to an instant stop.

ADVANTAGES.

One man unaided, can operate Hoist (see Fig. 2).

Hoist raises 500 lb. load at speed of 60 feet per minute.

The Hoist equipment is compact and very easy to erect.

We furnish all necessary clamps and bolts, and blue print showing erection in detail. The sidewalk doors and spring guard gates make open hoistway absolutely safe for operator and pedestrian. Where the sidewalk opening is so located that the building wall does not afford protection when the doors are open, an additional set of spring guard gates can be installed to completely safeguard hoistway.

CONSTRUCTION.

The strongest and most durable materials are used. Hoisting head is a steel casting. Steel cable is non-rotating. All gears are machine cut. Every Hoist is subjected to thorough working test before shipment. All Hoists are painted before shipment.

MOTOR.

Hoist has a $1\frac{1}{2}$ h.p. A.C. or D.C. totally enclosed motor with brake, automatic upper limit, and single speed controller. Current is only consumed when hoisting. The apparatus is dust and moisture proof, lubrication being effected throughout by means of grease forced through compression cups.

PRICES.

Prices are governed by distance of lift and size of opening, when requesting quotation please supply this information.

HOW TO SPECIFY SIZE OF AREA

See specifications and scale drawings in October 1921 catalog on file in all architects' offices.

We strongly recommend that the area be made 4 ft. x 4 ft. in size for all models. This gives the operator room enough to do his work. If necessary, a smaller or larger area may be provided, but it is not as practical.

CAPACITY.

No part has a factor of safety of less than eight based on the ultimate strength of the material when the maximum load of 500 lbs. is raised.



FIG. 1. MODEL E.

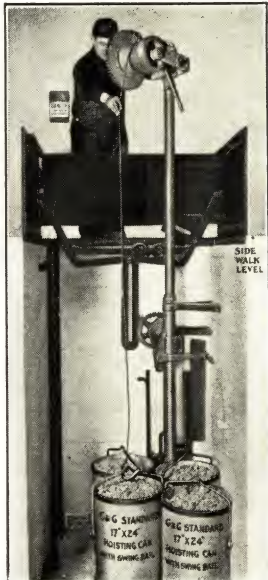


FIG. 2. MODEL A.



FIGS. 3 AND 4. MODEL D.



FIG. 5. MODEL B: EMPTYING CAN INTO WAGON. HOISTING HEAD REVOLVES ON BALL-BEARINGS.

Fig. 2 shows how one man, unaided, can "hook" and raise four or five G & G Swing Bail Cans without leaving sidewalk. We recommend that area be made 4 ft. x 4 ft. in size. A 4 ft. x 4 ft. hoistway area is the best size for all G & G Standard Hoists.

MODEL "D"
OVERHEAD CRANE
HOIST WITH
ELECTRIC MOTOR
(TWO-MAN MODEL).

MOTOR.

MODEL "C"
HOIST WITH
ELECTRIC MOTOR
(TWO-MAN MODEL).

MOTOR.

MODEL "B"
OVERHEAD CRANE
MANUAL HOIST
(ONE-MAN MODEL).

CAPACITY.

MODEL "A"
MANUAL HOIST
(ONE-MAN MODEL).

**G & G COMPLETE
EQUIPMENT FOR
ALL MODELS**

G & G Telescopic Overhead Crane Hoist, Model "D," with Complete Equipment operates electrically (Figs. 3 and 4) and is for use in large buildings where the grade level approach permits wagons to drive up alongside of the hoistway leading to cellar or boiler room. When not in use, no part of Hoist shows above sidewalk.

Model "D" raises a maximum load of 300 lbs. at an actual speed of 60 feet per minute. The can shown in Fig. 3 weighs about 175 lbs. when filled with ashes. Also constructed for maximum working capacity of 500 lbs.

Hoist has a $1\frac{1}{2}$ h.p. (series wound for D.C., squirrel cage for A.C.) totally enclosed motor with magnetic service brake, mechanical load brake, automatic upper and lower carbon point limits, and single speed controller giving one hoisting and one lowering speed. Cable is non-rotating. The apparatus is dust and moisture proof, lubrication being effected throughout by means of grease forced through compression cups.

G & G Telescopic Hoist, Model "C," with Complete Equipment operates electrically and is used in large buildings where a considerable number of cans or other loads must be handled daily and where grade level approach does not permit wagons to drive up alongside of hoistway. Raises a maximum load of 500 lbs. to grade level at an actual speed of 60 feet per minute. When not in use the Hoist telescopes and no part shows above sidewalk.

Located in cellar, and identical with motor described for Model "D" Hoist.

Illustration (Fig. 5) shows the G & G Telescopic Overhead Crane Hoist with Complete Equipment, as installed for Ash Removal. This Hoist equipment is so arranged that the operator, standing at grade level, may raise cans from cellar and empty them directly into wagon or truck without rehandling at grade level. This Hoist has the telescopic feature, so that no part shows above pavement when not in use.

Raises maximum load of 300 lbs. at a speed of 30 feet per minute. A pressure of not more than $12\frac{1}{4}$ lbs. is required on hoisting handle to raise filled ash cans. The can shown in Fig. 5 weighs about 175 lbs. when full of ashes. Also constructed for maximum working capacity of 500 lbs.

G & G Telescopic Hoist, Model "A," with Complete Equipment is installed in buildings where it is desired to use manual power for raising and lowering loads and where sidewalk opening is so situated that trucks cannot drive alongside. One man, unaided, can operate Hoist (see Fig. 6), and loads up to 500 lbs. are easily raised at a speed of 30 feet per minute. A pressure of only $12\frac{1}{4}$ lbs. is required on hoisting handle to raise filled ash cans. Hoisting Head revolves on ball bearings, depositing can, without lifting, on sidewalk. For lowering, a powerful band brake is provided. Hoist is equipped with Automatic Gear Shifting Brake Device. Hoisting handle does not revolve when load is lowered. The patented "Silencer" makes Hoist extremely quiet in operation.

The Sidewalk Doors and Spring Guard Gates are operated *automatically* when Hoist is placed in or out of service. The doors *lock* automatically when fully open or entirely closed. Automatic electric warning bell operates when doors are being opened or closed. The iron ladder affords a direct passage for operator between cellar and grade or between floors. The swing bail cans enable operator to "hook" cans from grade without descending to cellar. The ash can truck makes for quick transportation of cans in cellar and avoids damage to floor and can caused by dragging and rolling cans. All parts carefully inspected and tested before shipment.

This equipment is especially designed for use with the G & G Hoist. When specifying Hoist, include the words "With Complete Equipment" in order to secure maximum working efficiency.

Write for practical formula showing how to determine which model to specify.

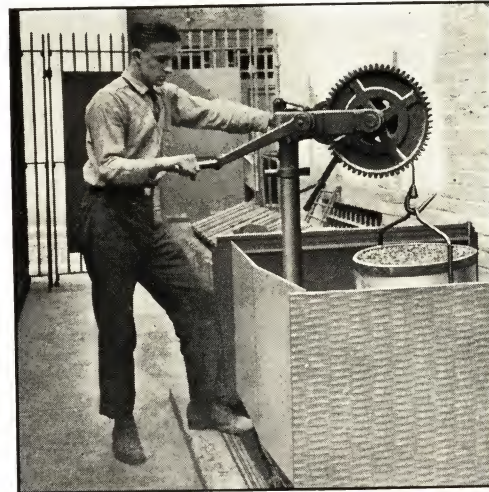


FIG. 6. MODEL A.
REVOLVING HOISTING
HEAD WITH
CAN

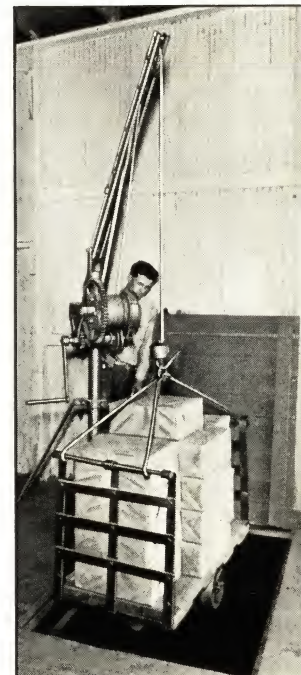
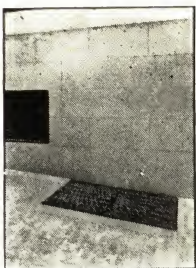
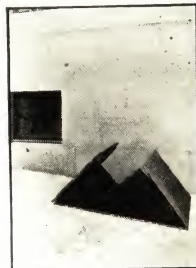


FIG. 7. MODEL B, NON-TELESCOPIC
HOIST AS USED IN A PAPER PLANT.



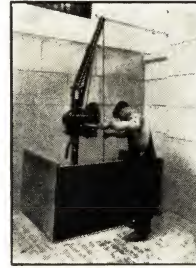
View of Hoistway
Sidewalk doors closed
flush with pavement,
automatically locked.



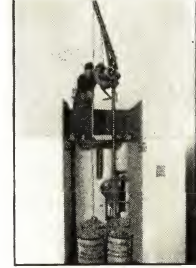
As hoisting head is
raised, sidewalk doors
automatically open—
alarm bell rings.



Operator ascends iron
ladder and lifts over-
head crane into position.



Operator hooking, un-
aided, a G & G Standard
Swing Bail Hoisting
Can.



Operator hooking, un-
aided, a G & G Standard
Swing Bail Hoisting
Can.



Operator raises the
filled can without leav-
ing the sidewalk. Then
hoisting head swings



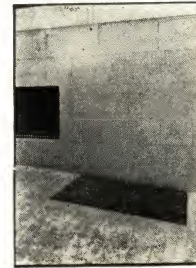
on ball bearings and
can is emptied into
wagon without rehand-
ling at grade.



Lowering empty can
by gravity. Hoisting
handle does not revolve.



Operator "dips" over-
head crane, descends
iron ladder and lowers
hoisting head.



Sidewalk doors auto-
matically close and lock
flush with pavement.

FIG. 8. OPERATING MODEL B (MANUAL) G & G TELESCOPIC HOIST, IN CONNECTION WITH THE G & G FLUSH WATERTIGHT SIDEWALK DOORS, EQUIPPED WITH THE G & G AUTOMATIC SIDEWALK DOOR OPENING AND CLOSING DEVICE AND SPRING GUARD GATE. SIDEWALK DOORS ARE SELF-LOCKING, WHETHER OPEN OR CLOSED.

Note that one man, unaided, performs entire operation



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PRODUCTS.

MANUFACTURERS OF "COVERT IMPROVED" FIREPLACE DAMPERS AND "WATERTITE" HOODED SCUPPERS.

"COVERT IMPROVED" FIREPLACE THROAT AND DAMPER.

The illustration shows proper construction of fireplace to secure best results. The wind-shelf at the bottom of smoke chamber is important for checking down drafts, which are liable to occur under certain atmospheric conditions. The slope of the back should start well down in the fireplace, as shown, and should be a straight, not a curved line.

ADVANTAGES.

This damper, installed as shown in our literature, will positively check the smoking so common to a great many fireplaces. We frequently supply the Covert Damper to rectify smoke troubles caused by other dampers not properly designed.

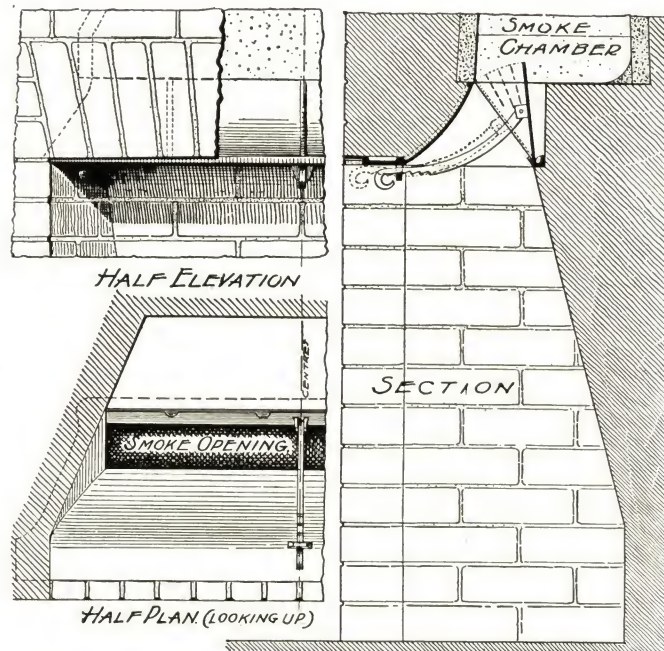
FEATURES.

The front flange of damper supports the brick or stone over arch; the sides are splayed, the throat is high arched, narrows gradually and follows a line with the sloping back of the fireplace. This damper has no concealed working parts; no device passing through or exposed on the face of brickwork; and the valve plate can be removed in a minute for cleaning.

The operating ratchet is under the arch at the front, conveniently placed, but in an inconspicuous position. It is practically incapable of getting out of order.

LITERATURE.

"Hints on Fireplace Construction," a folder dealing with the design of wood and coal burning fireplaces, will be mailed to anyone interested upon application.



"WATERTITE" HOODED SCUPPERS.

FUNCTION.

Provide for the immediate discharge of water thrown on the floor in case of fire. They prevent the wrecking of goods by water and interruption of business, and in conjunction with other fire-retarding appliances, reduce the insurance rate.

Every factory, mill, warehouse or other building where materials are used or stored should be equipped with Scuppers.

CONSTRUCTION.

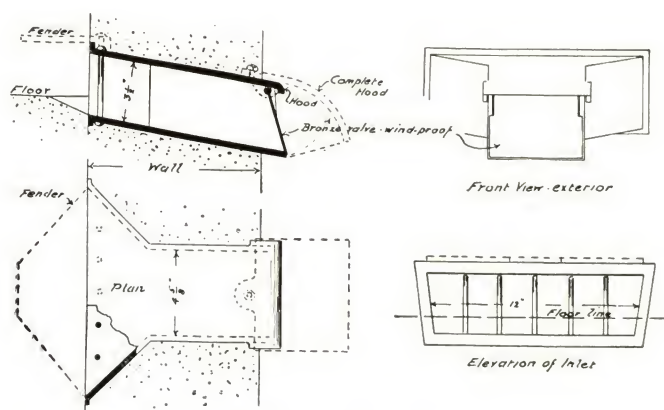
All "Watertite" Scuppers have a heavy cast-iron body (painted or galvanized), a patented cast-iron hood, a grating at inner wall and a cast bronze or brass valve.

ADVANTAGES.

The Hood (an exclusive "Watertite" feature) protects the valve from mortar, dirt or ice. The valve swings in non-corrosive bearings, excludes cold air, is wind-proof, and opens on the slightest pressure of water. The grid at inlet excludes all floating objects that might get into the scupper and block the outlet, but leaves the interior open to view.

REFERENCES.

A few "Watertite" Installations:
Canadian General Electric Co., Ltd., Toronto.
Northern Aluminum Co., Ltd. "
Barber Ellis, Ltd., "
American Watch Case Co. "
Firestone Tire & Rubber Co., Ltd., Hamilton
Spectator Printing Co. "
B. Greening Wire Co. "
Steel Co., of Canada, Ltd., Montreal.



TYPE F. HOODED SCUPPER
Approved by Underwriters.

LITERATURE.

Catalog illustrating the Type B and Type F Scuppers, with capacities and full description, mailed upon request.

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We are also Distributors for:

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Salt Glazed and Enameled Brick
Paving Brick, Floor Brick and Tile
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Patent Safety Scaffold Machines.

DRUMMOND & REEVES, LIMITED.

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DISTRIBUTORS IN
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SELF-RAISING PLATFORM LIFTS—Hand and Motor Driven. TELESCOPIC ASH HOISTS—Sidewalk and Vehicle Types. AUTOMATIC SAFETY-GUARDED SIDEWALK DOORS. TYPE "A" LIGHT SIDEWALK PLATFORM LIFTS. PERFECTION CELLAR-WINDOW ASH ELEVATORS.

ERNST SELF-RAISING PLATFORM LIFT.

A Sidewalk Lift of unusual merit that can be operated through a cellar window or a sidewalk door. 7-inch channel uprights inclined but 2' 5" from supporting angles. Lowers loads of 300 to 1,000 lbs. by gravity, controlled by powerful hand brake.

SPECIAL FEATURES.—An endless chain drive fitted to special sprocket wheels and cranking mechanism directly attached to uprights.

The platform is so counter-balanced that it rises automatically when empty, without cranking, and is quickly lowered when empty by merely spinning the cranking wheel.

The lift is self-supported, requiring but 4 anchor bolts to set in place, and installation requires but a few hours work. Can be installed with or without pit.

CAPACITY.—A powerful cranking mechanism and the heavy balancing carriage permit the raising of 1,000 lbs. with exceptional ease of operation.

Eliminates the cost of an outside areaway, and the danger of an open hatchway.

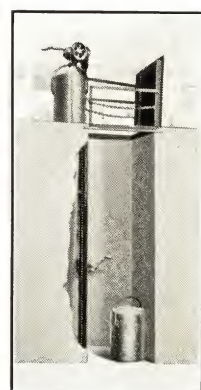
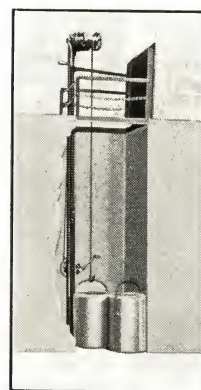
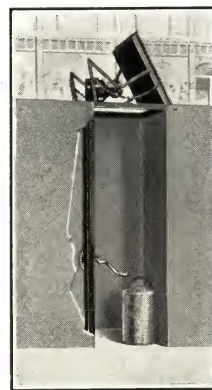
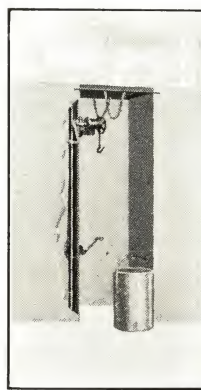
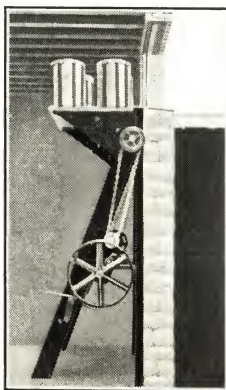
Can be installed convenient to boilers and operated through any basement window.

A 1-h.p. motor, mounted between uprights, operates hoist at a speed of 18 to 20 ft. per minute. Hoist is controlled both ways by automatic switch and brake. Makes an ideal lift for heavy duty and for high cellars.

SELF-RAISING PLATFORM LIFT.

WINDOW TYPE

MOTOR DRIVEN



SELF-RAISING PLATFORM LIFT

FIG. 1. SHOWS LIFT INSTALLED IN AREAWAY, OPERATING THROUGH SIDEWALK.

FIG. 2. LIFT USED THROUGH CELLAR WINDOW 1000 LB. CAPACITY.

FIG. 3. DOOR CLOSED HOIST TELESCOPES BELOW SIDEWALK.

FIG. 4. PARTLY OPEN. NOTE GUARDS SPRINGING INTO POSITION.

FIG. 5. DOOR OPENED AND HOIST RAISED BY OPERATOR IN CELLAR.

FIG. 6. CAN RAISED READY TO EMPTY BY OPERATOR AT SIDEWALK.

ERNST TELESCOPIC SIDEWALK HOIST.

CAPACITY.—400-500lbs. **SPEED.**—35ft. per minute. A practical, compact, one-man operated Hoist, with which three or four cans may be raised and emptied without operator having to leave sidewalk level. Operates entirely from sidewalk.

CONSTRUCTION.—Only the strongest and best materials are used, and every labor-saving device is incorporated to make this the fastest, easiest and safest hoist obtainable. The drum on hoisting arm, which is grooved for $\frac{3}{8}$ " flexible steel cable, operates on ball bearings, which ensures quiet and easy operation. An automatic clutch locks hoisting arm at proper height, and a gear-shift, operated by foot at sidewalk, disengages gears and allows loads to be lowered by brake. Crank handle does not revolve when lowering. The cranking mechanism is detachable when not in use.

ERNST TELESCOPIC VEHICLE HOIST.

Similar in operation and general construction to the Sidewalk Hoist, but with an extension arm for direct unloading into wagon up to 8' above grade. Saves entirely the rehandling of cans at sidewalk. Hoist telescopes below sidewalk when door is closed. Has capacity of 300lbs. and is entirely one-man operated.

SAFETY-GUARDED SIDEWALK DOOR.—Specially designed for use with Ernst Telescopic Sidewalk and Vehicle Hoists. A door operating device automatically opens or closes the sidewalk door as hoisting arm is raised or lowered, the door is locked at any position and safety guards automatically spring into position—all in one operation. Door is one piece, checkered steel plate, flush with sidewalk and has concealed frame and hinges.

TYPE "A" LIGHT SIDEWALK LIFT.

Made in two capacities—500lbs. with platform up to 3' x 3', cranking mechanism bolted to wall (See Fig. 7), and 750lbs. with platform up to 4' x 4' and quadruple gearing stand bolted to floor. Can be installed with a pit as shown, or without pit, platform lowering to within 14" of floor.

CONSTRUCTION.—All metal, including platform. Upright platform guides are non-binding, compound gears are machine cut, and powerful brake permits lowering by gravity. Has a safety ratchet to lock platform at any position.

Makes a quick, reliable trunk lift for Hotels, Apartments, Colleges, Institutions, etc.

PERFECTION CELLAR-WINDOW ELEVATOR.

CAPACITY.—300lbs. **SPEED.**—25' per minute.

A simple, compact and easy operating hoist that can be operated through any cellar window. Has compound gears, safety ratchet and brake. Operating handle is non-rotating when lowering load. All metal construction, including 21" diameter platform.

Ernst Hoists are installed in Schools, Banks, Office Buildings, Factories, etc., throughout Canada, and also throughout the United States.

Folders with full description, drawings and details will be furnished upon request.

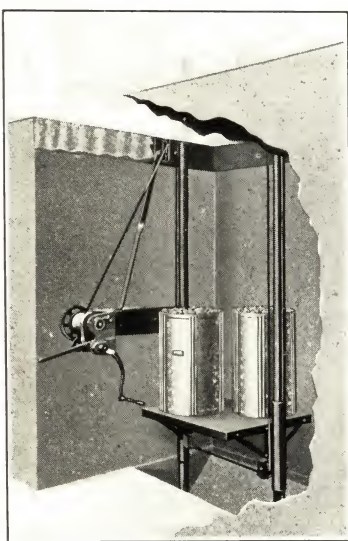


FIG. 7. TYPE "A" LIFT USED WITH PIT. NOTE COMPACTNESS OF CRANKING MECHANISM.

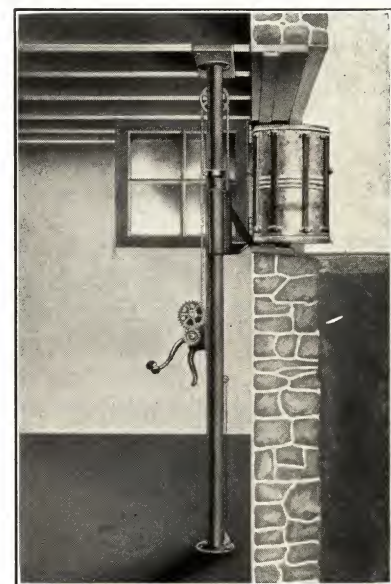


FIG. 8. PERFECTION HOIST.

REFERENCES.

LITERATURE.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED

MANUFACTURERS OF

PASSENGER AND FREIGHT ELEVATORS,

DUMB WAITERS, ESCALATORS, INCLINED FREIGHT ELEVATORS AND GRAVITY PACKAGE CONVEYORS.

HEAD OFFICES: 50 BAY STREET,
TORONTO, ONT.

WORKS:—VICTORIA AVENUE
NORTH, HAMILTON, ONT.

BRANCH OFFICES:

CALGARY—322-5 Ninth Ave. W.
EDMONTON—10252 105th St.
HALIFAX—215 Lower Water St.
HAMILTON—31 Main Street East.
LONDON—Bank of Toronto Chambers.

MONTREAL—368 St. James Street.
OTTAWA—254 Queen Street.
QUEBEC—168 Dorchester Street.
REGINA—Cor. Eleventh Ave. & Lorne St.
ST. JOHN, N.B.—88 Princess Street.

TORONTO (DISTRICT)—50 Bay Street.
VANCOUVER—1132 Mainland Avenue.
VICTORIA—635 Dominion Road.
WINDSOR—Royal Bank Building.
WINNIPEG—316 Cumberland Avenue.

GENERAL.

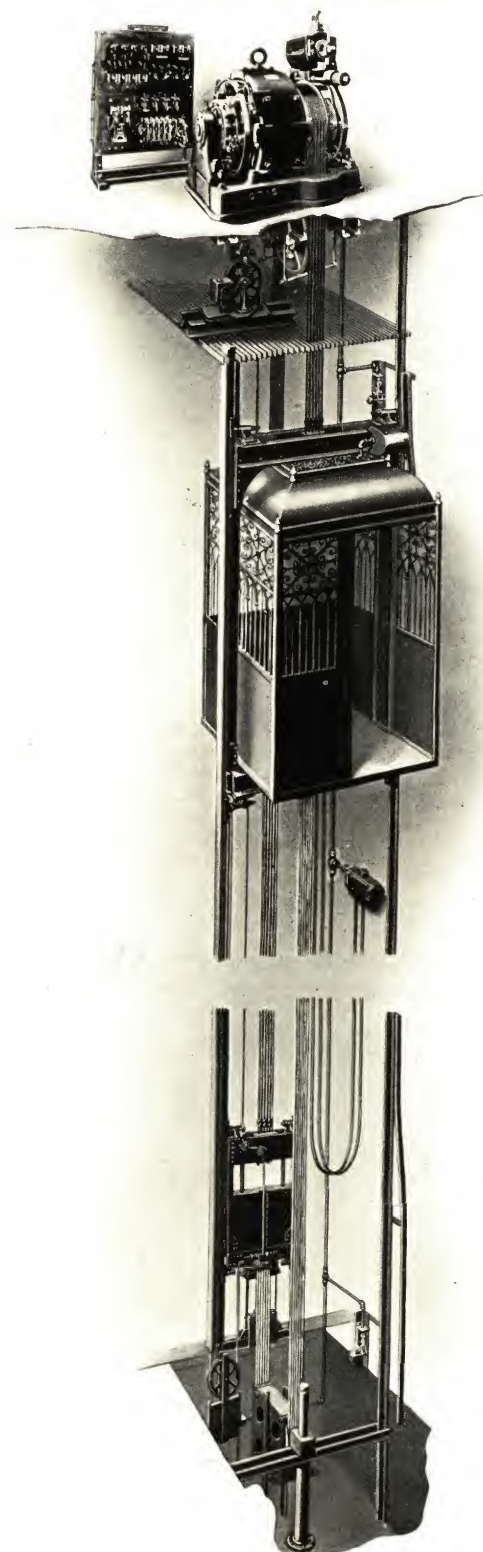
In presenting the accompanying lay-outs of elevators, our object is to place in the hands of architects and engineers who have the preparing of plans for buildings exact and reliable data which will enable them to make proper provision for the reception of the elevator equipment, thus insuring from the start a proper installation without having to make expensive alterations when the building is about completed in order to obtain this result.

The drawings submitted are carefully prepared along the lines of established standard practice, and it is only necessary, therefore, to select the type of elevator required, and provide in the plans the required clearances at top and bottom, in the hatch and space required for the machinery.

STANDARD-IZING ELEVATOR CONSTRUCTION.

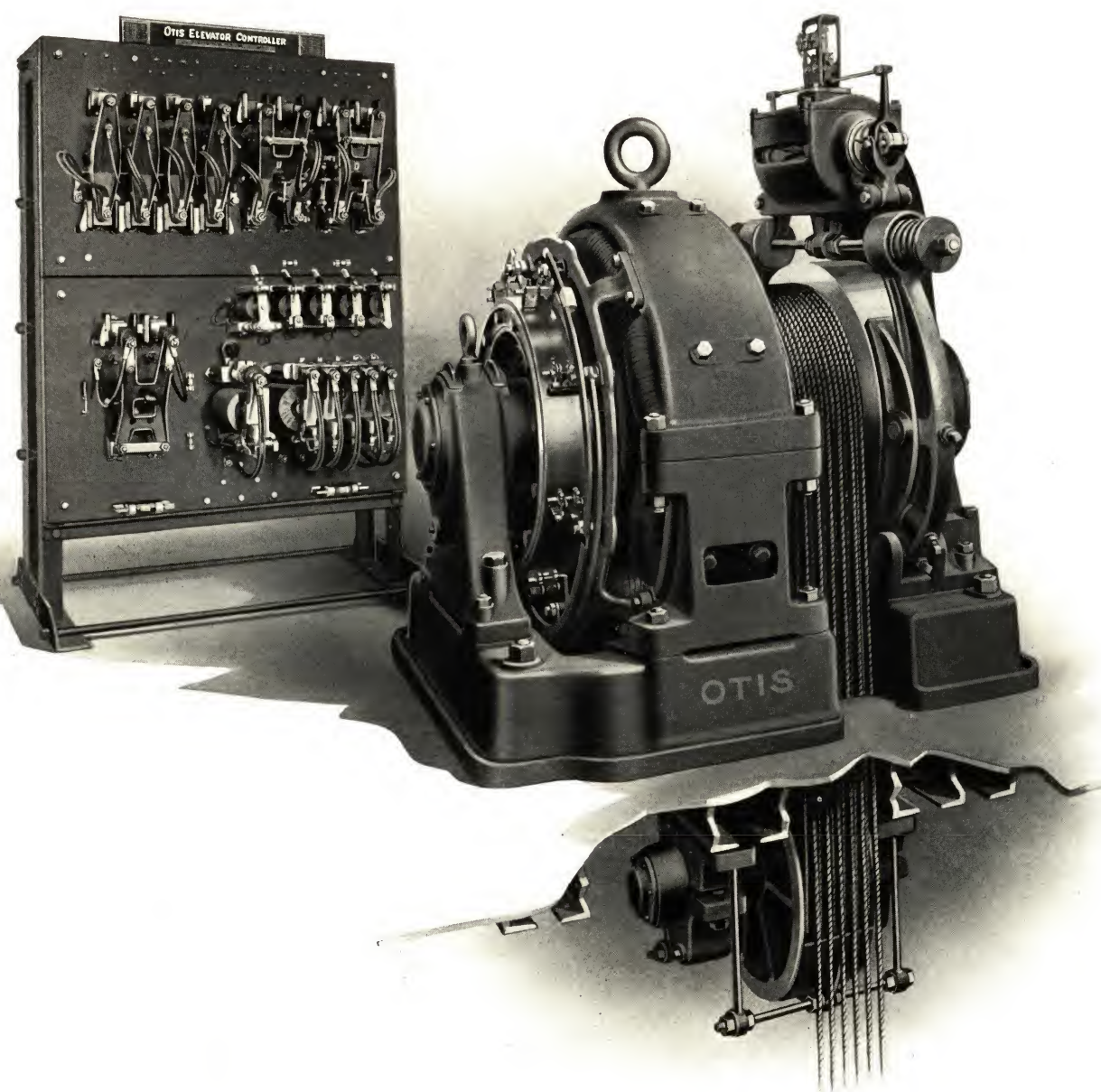
We have taken considerable pains to standardize elevator construction, as from our past experience we have repeatedly felt this would be of great benefit to the architect, in that the cost of installation could be materially reduced and deliveries facilitated if standard sizes were adopted: at the outset it would enable the architect, in preparing his plans, to provide the necessary accommodations, instead of the troublesome necessity of altering plans later on. We, as the manufacturers, could then make the parts in large quantities, instead of a few at a time, as is now rendered necessary owing to the innumerable varying conditions. This would enable us to ship promptly from stock when required.

We are convinced that those interested will see the great advantage to all concerned by the use of standard lay-outs and standard sizes. We, therefore, suggest to those who have the preparing of plans for buildings in which elevators are required, that they do their part to co-operate with us in attaining this very desirable end.



The above Illustration represents the complete installation of an Otis 1:1 Gearless Traction Elevator.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



OTIS GEARLESS TRACTION ELEVATOR, OVERHEAD TYPE, DIRECT CURRENT, SWITCH CONTROL.

INSTALLATIONS. Gearless Traction Machines are installed in the Singer Building, Woolworth Building, Equitable Life Building, and other large New York skyscrapers, and the following buildings in Canada are equipped with this type of Elevator:

TORONTO

Royal Bank Building.
Dominion Bank Building.
Excelsior Life Building.
T. Eaton Company's Store.
Northern Aluminum.
King Edward Hotel.

WINNIPEG

T. Eaton Company's Store.
Fort Garry Hotel.

MONTREAL

Eastern Townships Bank.
Transportation Building.
Canada Life Building.
Bell Telephone Company
Mount Royal Hotel.

VANCOUVER

Vancouver Hotel.
Dominic Burns Building.

OTTAWA

Parliament Buildings.
Connaught Building.
Hunter Building.

QUEBEC

Chateau Frontenac.

CALGARY

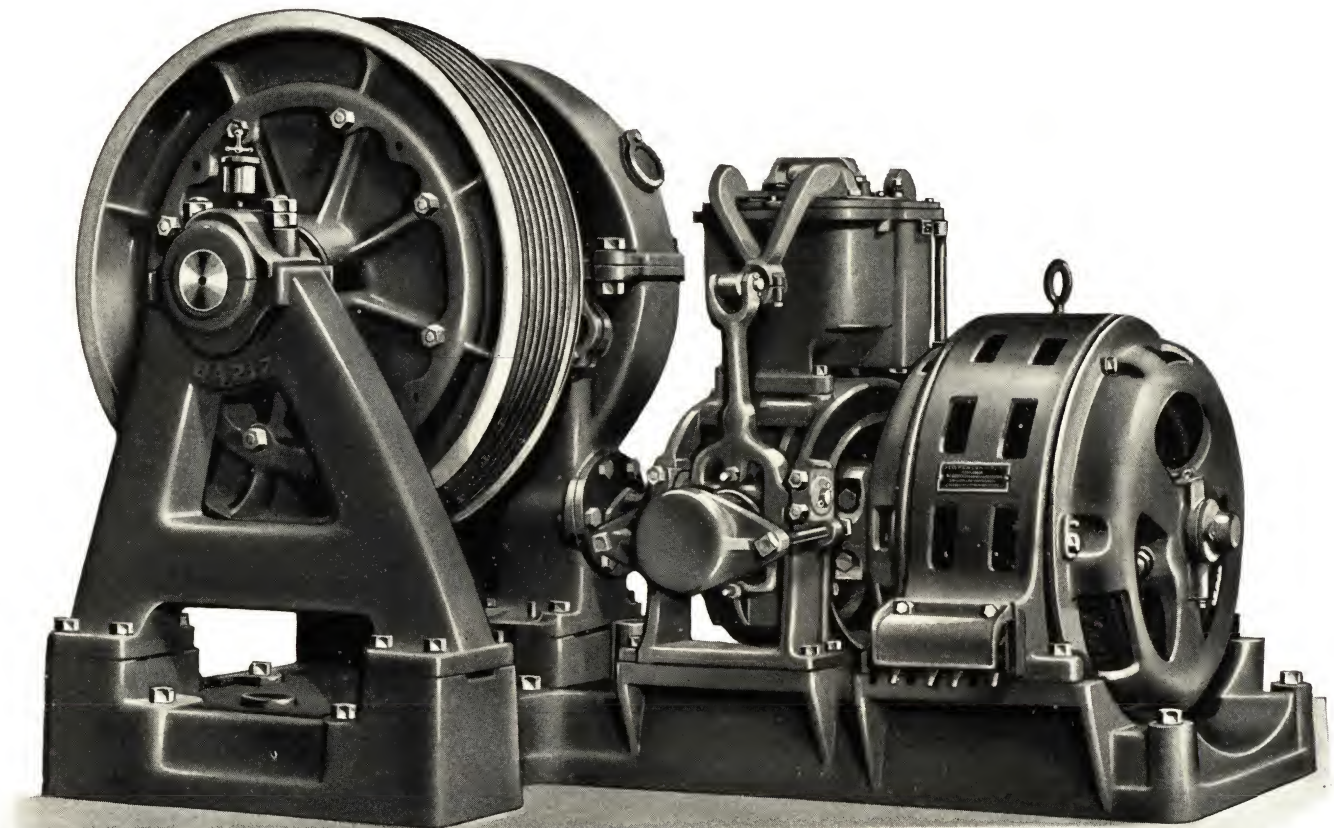
Calgary Herald.

EDMONTON

McLeod Building.

Micro Self-Levelling Machines are installed in the Northern Aluminum Building, Toronto, and the Chateau Frontenac, Quebec.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



OTIS SINGLE WRAP GEARED TRACTION ELEVATOR, OVERHEAD TYPE.
TWO SPEED. ALTERNATING CURRENT.

THIS MACHINE IS ALSO MADE FOR DIRECT CURRENT OPERATION.

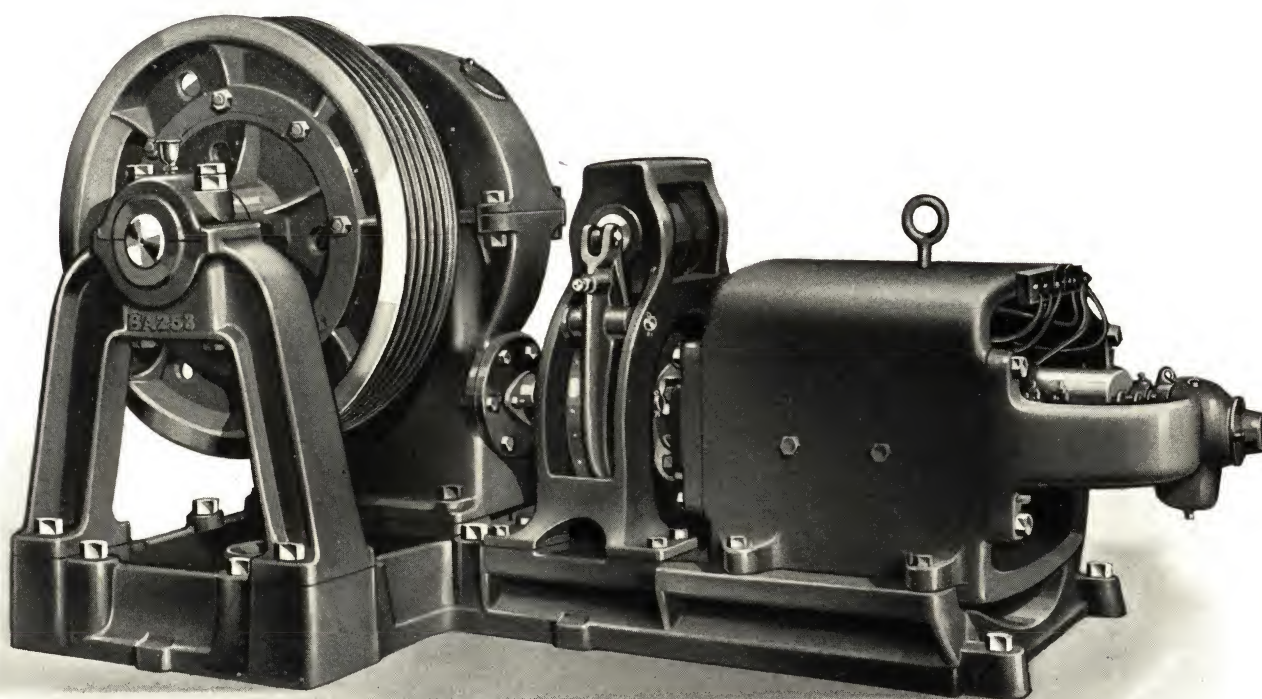
INSTALLATIONS. The first installation of the Alternating Current Machine, in Canada, is in the Prince Edward Hotel, Windsor.

The following buildings are equipped with Direct Current Machines:

The King Edward Hotel, Toronto.
The Mount Royal Hotel, Montreal.
The Olympia Hotel, Winnipeg.

The Bank of Hochelaga, Montreal.
General Accident Assurance Bldg., Toronto.
Chateau Frontenac, Quebec.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED

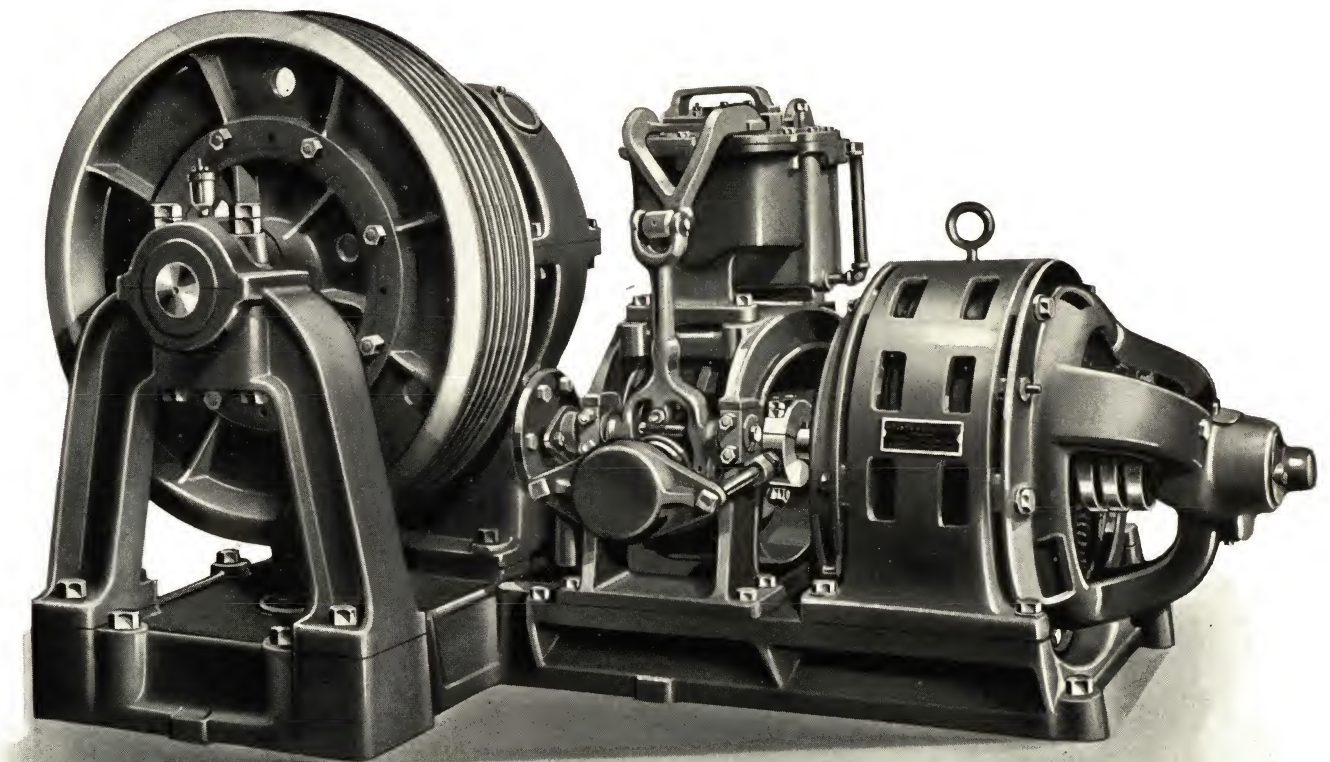


OTIS SINGLE WRAP GEARED TRACTION ELEVATOR.
OVERHEAD TYPE. DIRECT CURRENT.

INSTALLATIONS. Among the buildings in Canada in which this type of machine is installed are the following:

Great West Assurance Co., Winnipeg.	Canada Cement Co., Montreal.
Mount Royal Hotel, Montreal.	Bank of Hochelaga, Montreal.
Childs Restaurant, Toronto.	

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



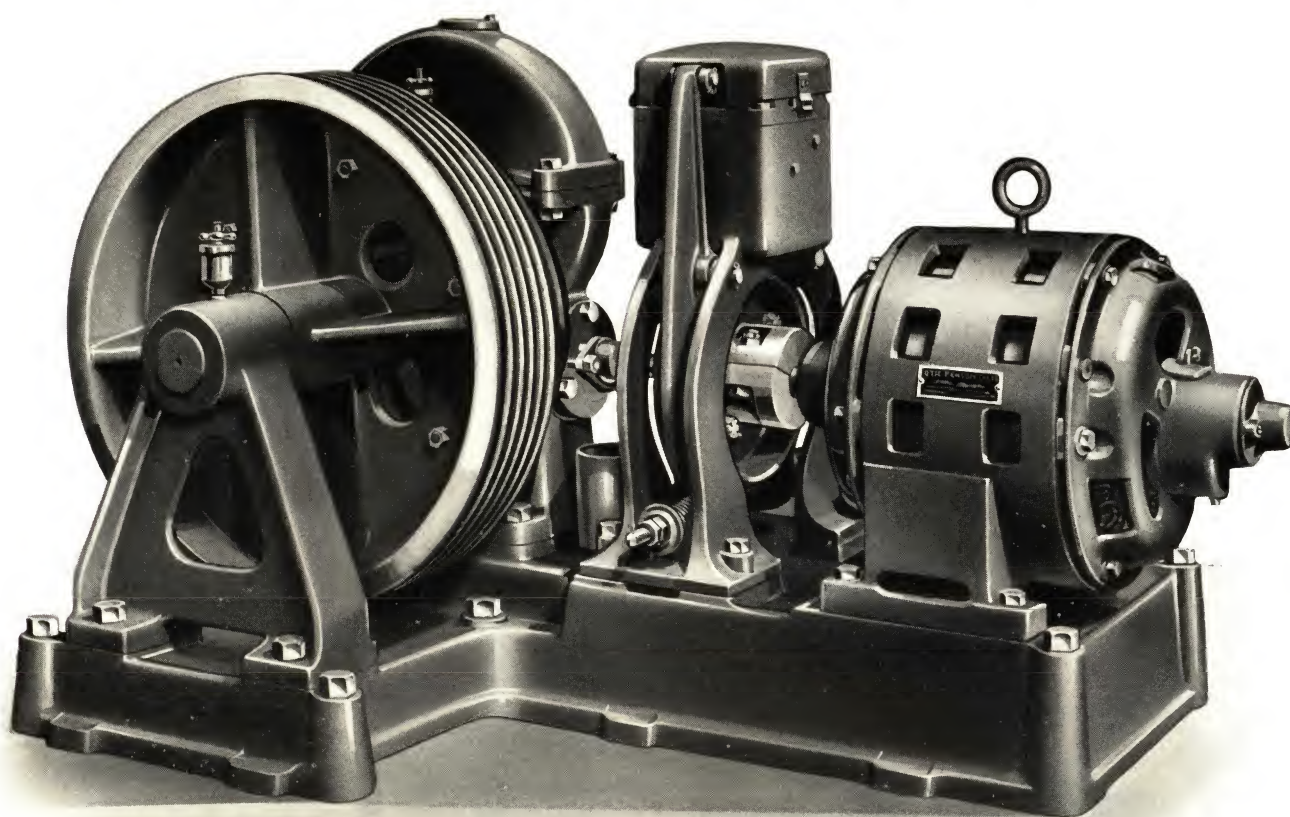
OTIS SINGLE WRAP GEARED TRACTION ELEVATOR.
OVERHEAD TYPE. ALTERNATING CURRENT.

INSTALLATIONS. Among the buildings in Canada in which this machine is installed are the following:

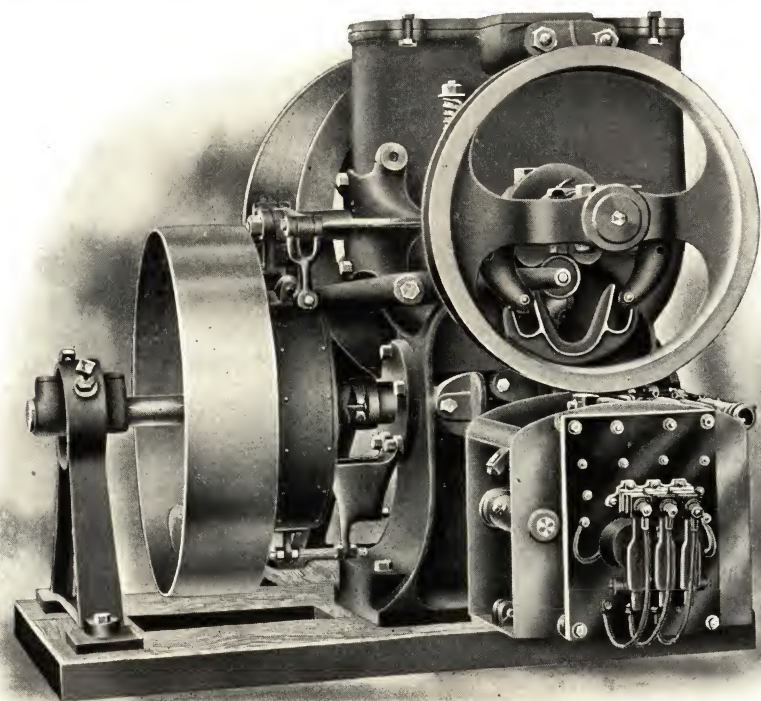
York Building, Toronto.
Elgin Development Co., Toronto.
Muskoka Hospital, Gravenhurst.
Court House, Sault Ste. Marie.

Crane Co., Ltd., Montreal.
Prince Edward Hotel, Windsor.
Bathurst Co., Ltd., Bathurst, N.B.
Post Office, Moose Jaw.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED

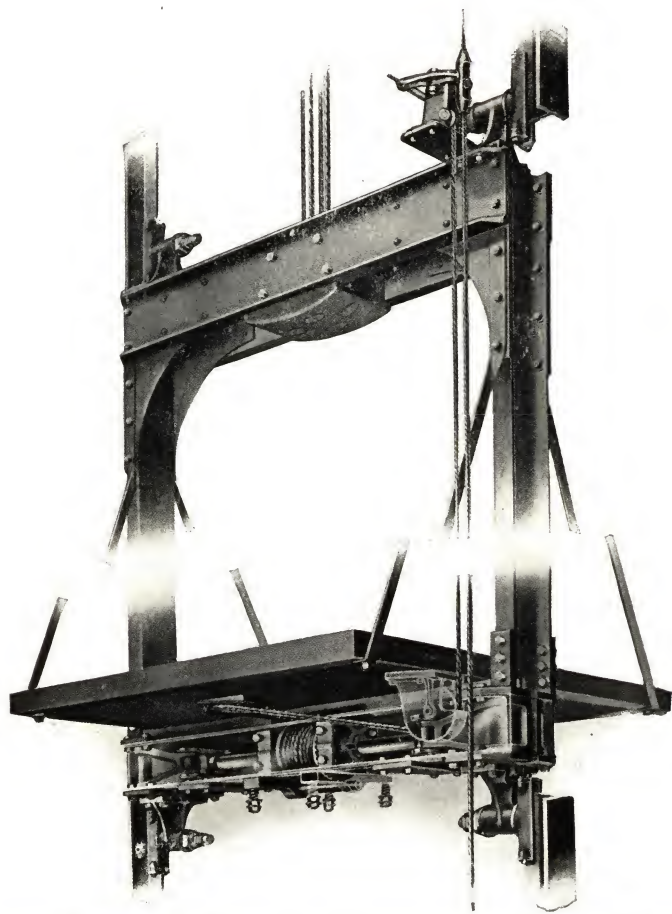


OTIS SINGLE WRAP GEARED TRACTION ELEVATOR.
OVERHEAD FREIGHT TYPE. ALTERNATING CURRENT. DIRECT CURRENT TYPE FURNISHED IF REQUIRED.



OTIS WORM GEARED, FLOOR TYPE, SINGLE BELTED, ELECTRIC FREIGHT ELEVATOR MACHINE. DIRECT CURRENT CONTROLLER IS SHOWN, BUT WILL BE SUBSTITUTED BY ALTERNATING WHERE REQUIRED.

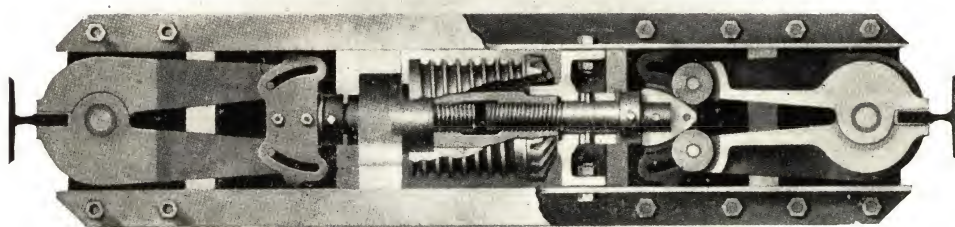
OTIS-FENSOM ELEVATOR COMPANY, LIMITED



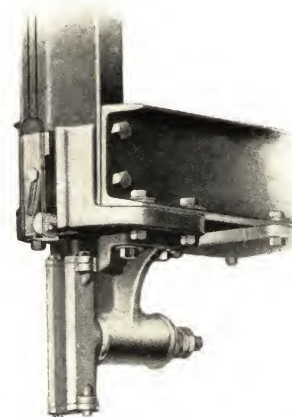
OTIS PASSENGER PLATFORM, WITH RELEASING CARRIER AND WEDGE CLAMP SAFETY, THE LATTER MOUNTED UNDERNEATH THE CAR, WITH ITS CHANNEL IRON FRAME REMOVED TO SHOW CONSTRUCTION DETAILS.



OTIS PLATFORM WITH ROLL GRIP SAFETY FOR MEDIUM AND SLOW SPEED ELEVATORS.

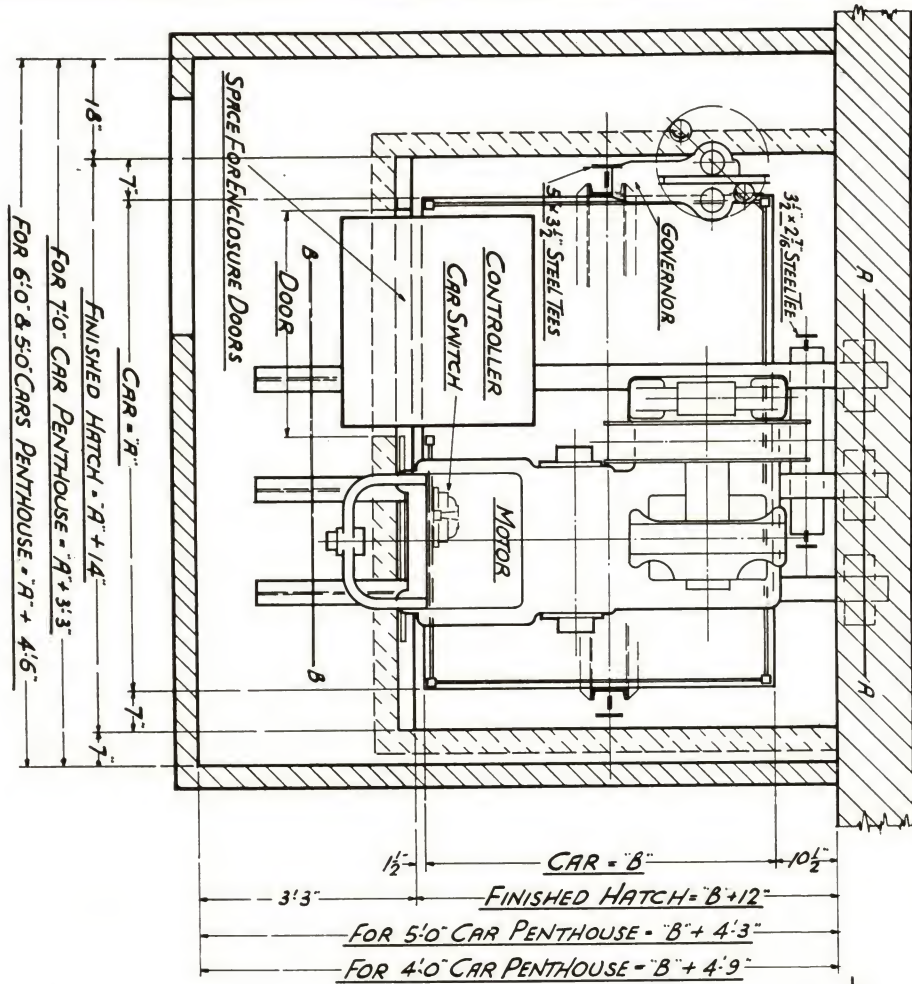


PLAN VIEW OF WEDGE CLAMP SAFETY DEVICE, WITH PARTS REMOVED TO SHOW CONSTRUCTION.

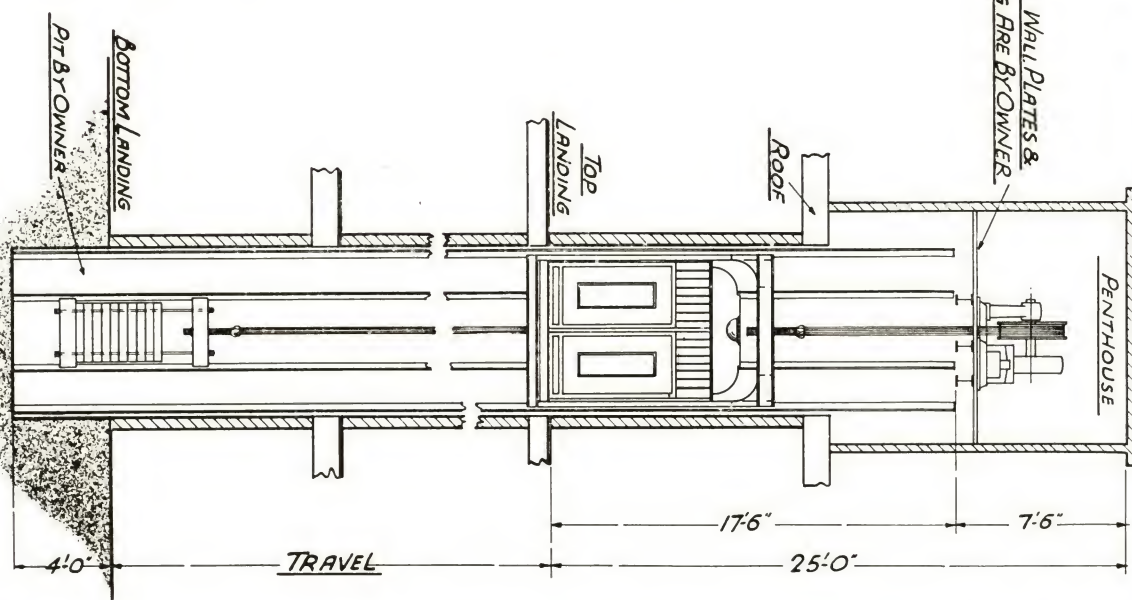


ENLARGED VIEW SHOWING ROLL GRIP SAFETY DEVICE.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



NOTE:-
BEAMS WALL PLATES &
FLOORING ARE BY OWNER



820E SINGLE WRAP TRACTION MACHINE DUTIES

CURRENT	LOAD IN LB.	SPEED F.P.M.
D.C.	2000	200
A.C. 25 cr	2000	175
A.C. 60 cr	2000	200
D.C.	2000	250
A.C. 25 cr	2000	250
A.C. 60 cr	2000	250
D.C.	2500	225
A.C. 25 cr	2500	200
A.C. 60 cr	2500	200

STANDARD CAR SIZES

A	B
5'0"	4'0"
5'0"	5'0"
6'0"	5'0"
7'0"	5'0"

LAYOUT NO. HTB 502

STANDARD SINGLE WRAP TRACTION PASSENGER ELEVATOR

CAR SWITCH CONTROL

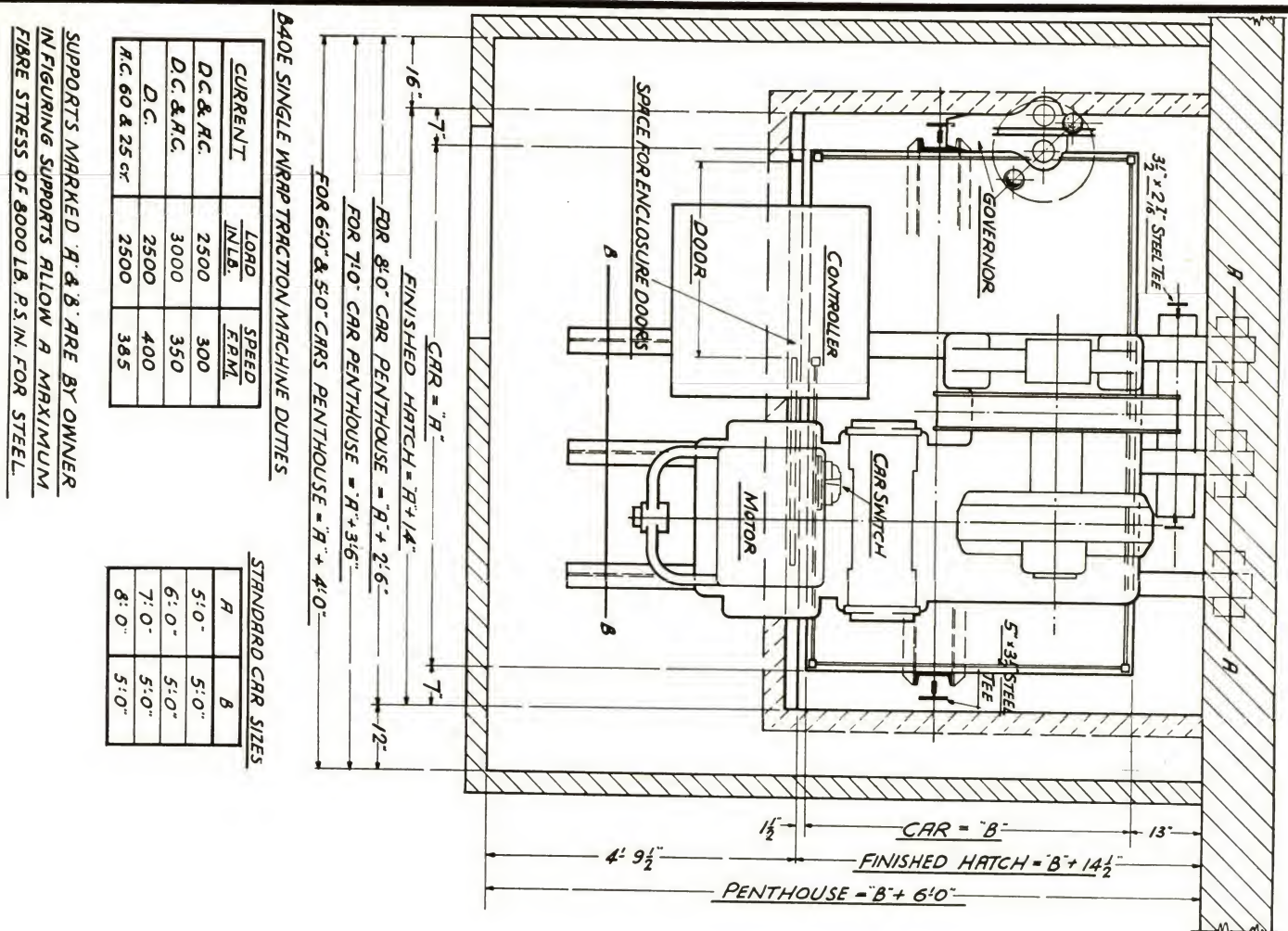
OTIS-FENSOM ELEVATOR COMPANY LIMITED

TORONTO - CANADA

No. HTB 502

SUPPORTS MARKED "A" & "B" BY OWNER
IN FIGURING SUPPORTS ALLOW A MAXIMUM
FIBRE STRESS OF 8000 LB. P.S.I. FOR STEEL.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



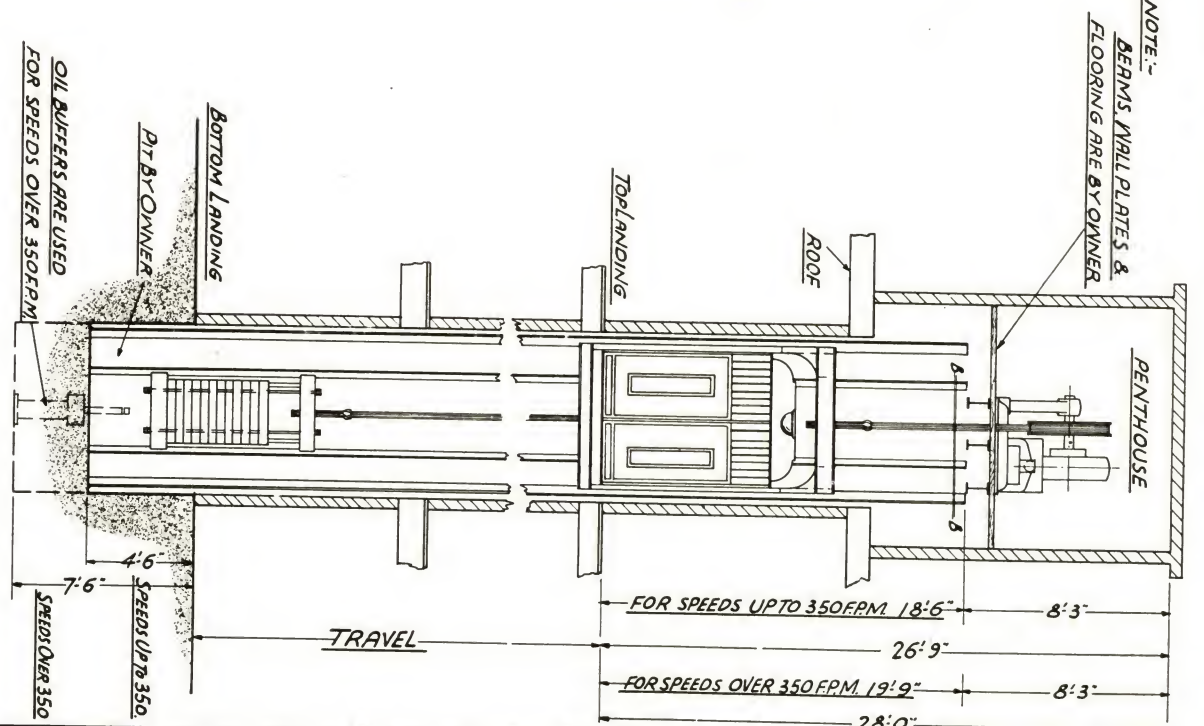
B40E SINGLE WRAP TRACTION MACHINE DUTIES

CURRENT	LOAD IN LB.	SPEED FPM.
D.C. & A.C.	2500	300
D.C. & A.C.	3000	350
D.C.	2500	400
A.C. 60 & 25 CY.	2500	385

STANDARD CAR SIZES

A	B
5'0"	5'0"
6'0"	5'0"
7'0"	5'0"
8'0"	5'0"

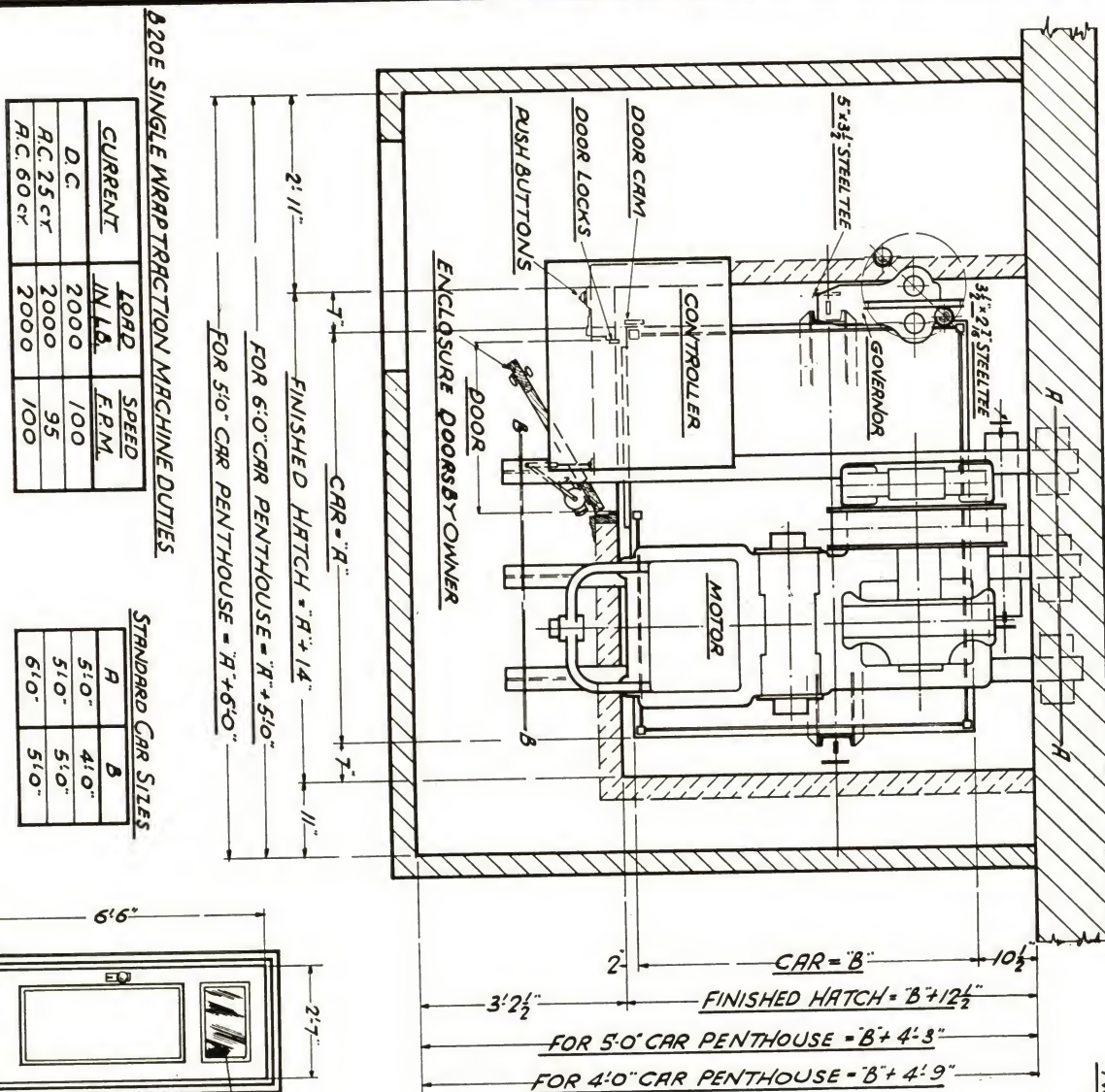
SUPPORTS MARKED A & B ARE BY OWNER
IN FIGURING SUPPORTS ALLOW A MAXIMUM
FIBRE STRESS OF 8000 LB. P.S.I. FOR STEEL.



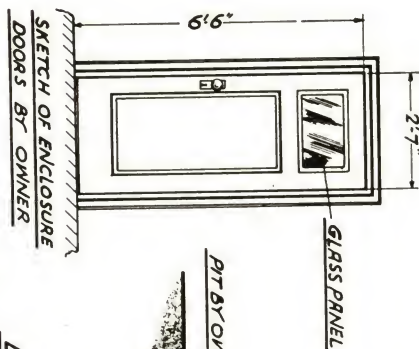
LAYOUT N^o HTB 504
STANDARD SINGLE WRAP TRACTION PASSENGER ELEVATOR
CAR SWITCH CONTROL
OTIS-FENSOM ELEVATOR COMPANY LIMITED
TORONTO - CANADA

No. HTB 504

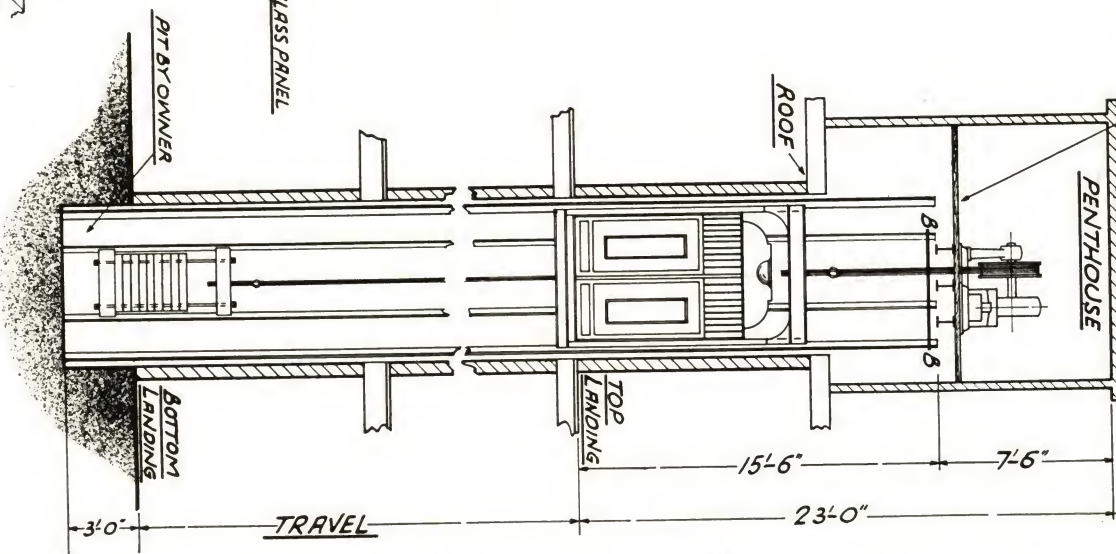
OTIS-FENSOM ELEVATOR COMPANY, LIMITED



NOTE: - BEAMS WALL PLATES & FLOORING ARE BY OWNER



LAYOUT No. HTB503



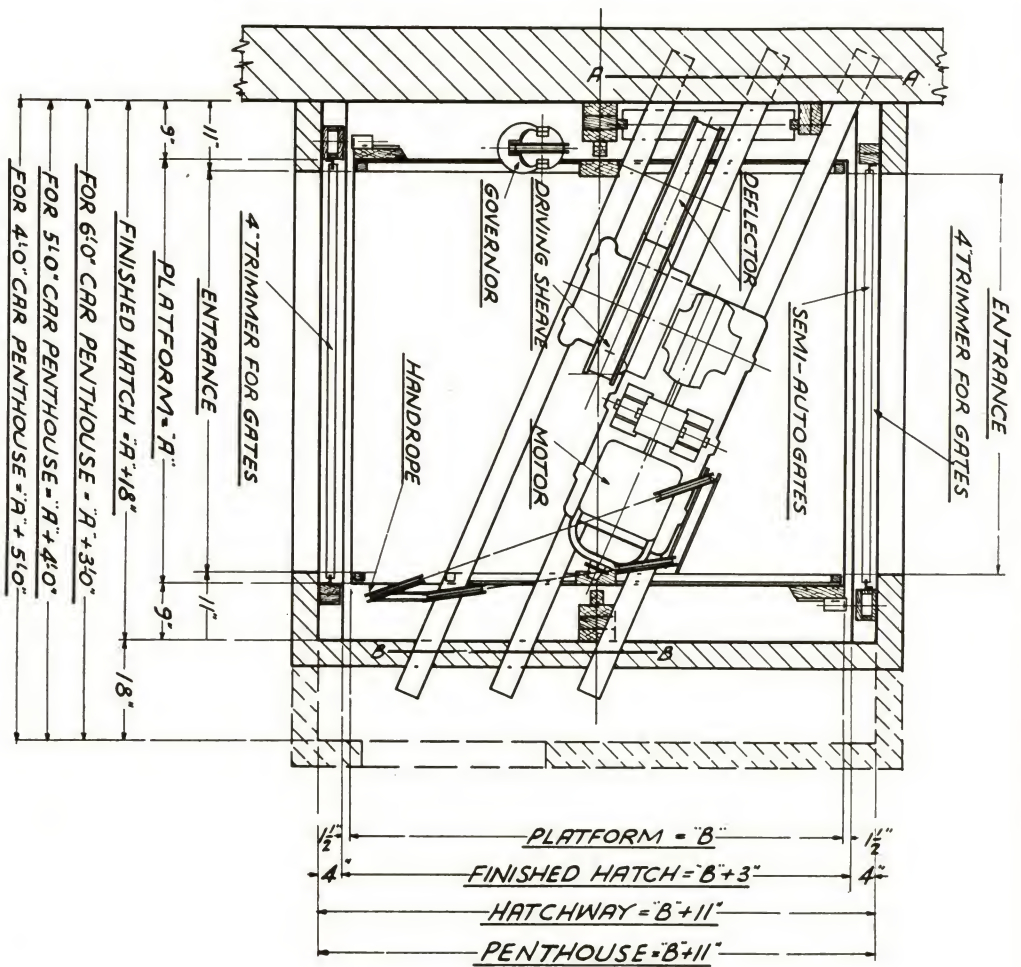
No. HTB 503

CONTINUED ON NEXT PAGE

SUPPORTS MARKED "A" & "B" ARE BY OWNER
IN FIGURING SUPPORTS ALLOW A MAXIMUM
FIBRE STRESS OF 8000 LB. P.S.I. FOR STEEL

STANDARD SINGLE WRAP TRACTION PASSENGER ELEVATOR
FULL AUTOMATIC PUSH BUTTON CONTROL
OTIS-FENSOM ELEVATOR COMPANY LIMITED
TORONTO — CANADA

OTIS-FENSOM ELEVATOR COMPANY, LIMITED

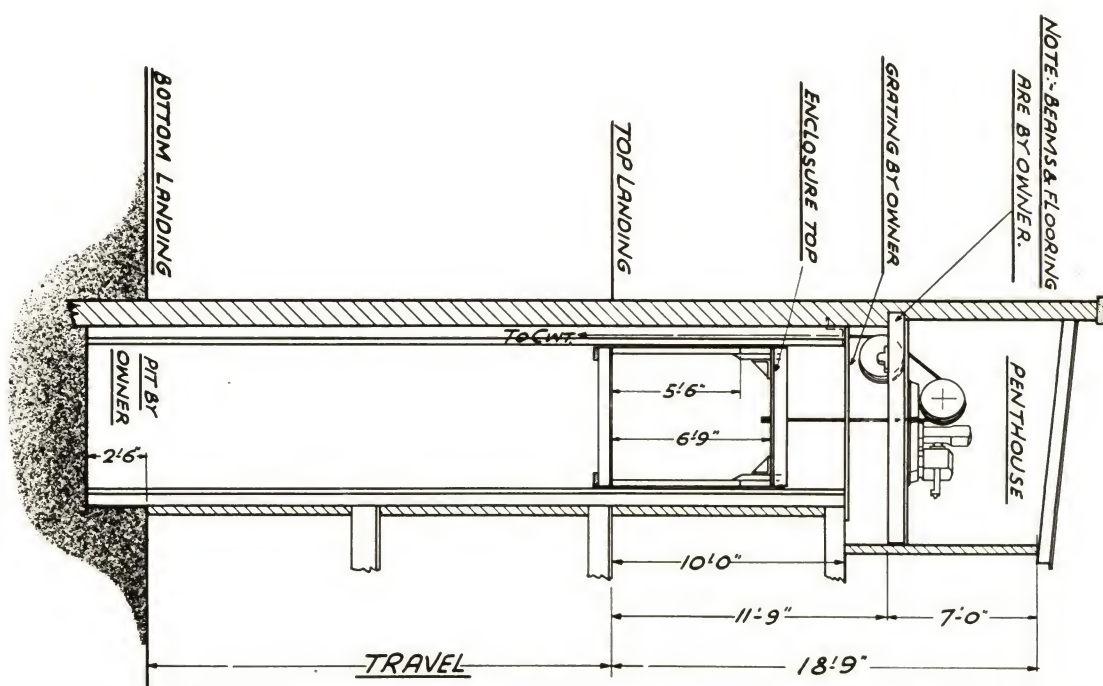


STANDARD CAR SIZES

A	B
4'0"	5'0"
5'0"	6'0"
6'0"	7'0"

8 3/4" SINGLE WRAP TRACTION MACHINE DUTY
CURRENT A.C. & D.C. LOAD 2000 LB. AT 50 F.P.M.

SUPPORTS MARKED "A" & "B" ARE BY OWNER
IN FIGURING SUPPORTS ALLOW A MAXIMUM
FIBRE STRESS OF 1000 LB. PSIN FOR WOOD.



LAYOUT NO. HTB 501

STANDARD SINGLE WRAP TRACTION FREIGHT ELEVATOR

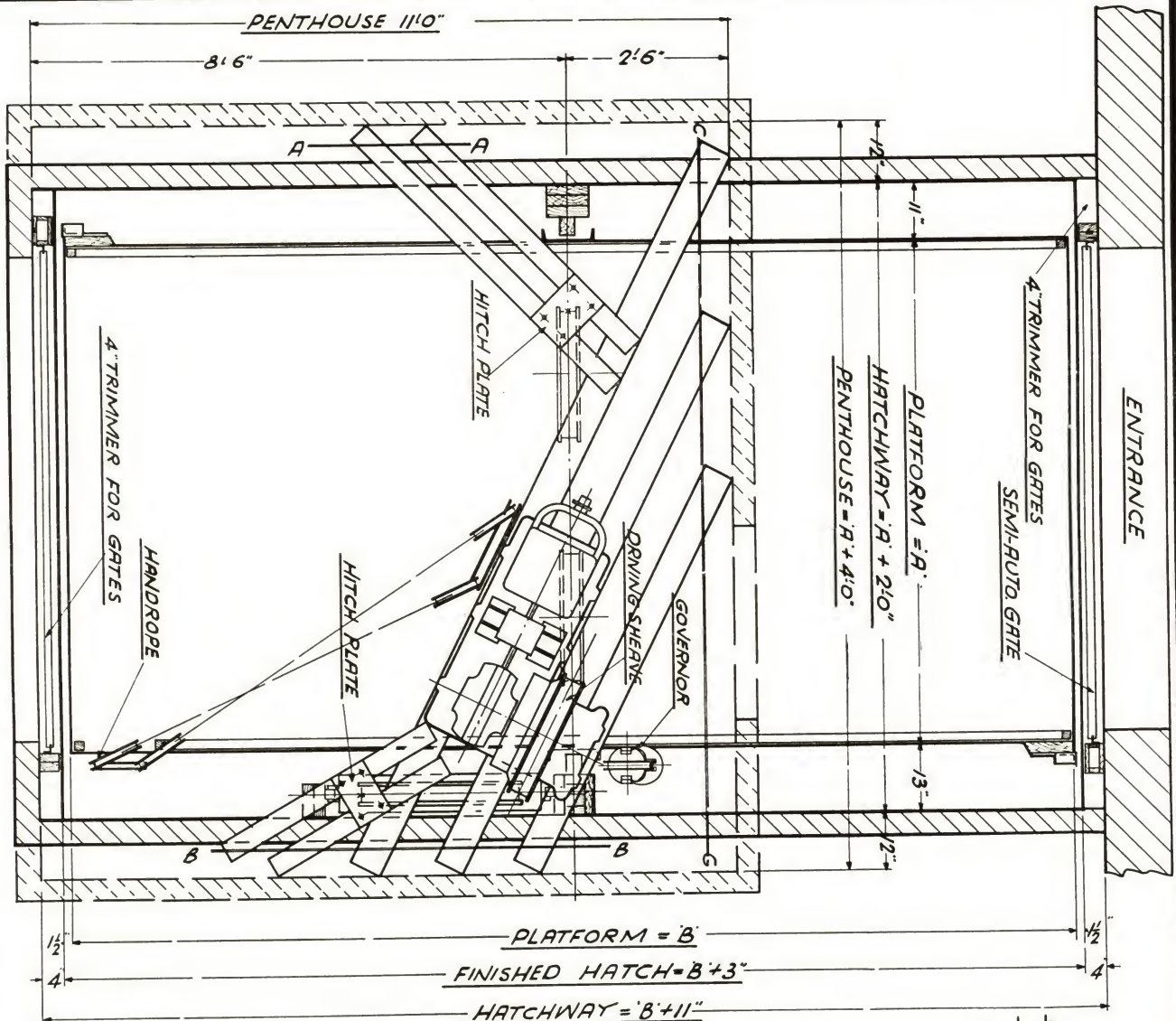
HANDROPE CONTROL

OTIS-FENSOM ELEVATOR COMPANY LIMITED

TORONTO — CANADA

No. HTB 501

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



ENTRANCE

SUPPORTS MARKED 'A' & 'B' ARE BY OWNER
IN FIGURING SUPPORTS ALLOW A MAXIMUM
FIBRE STRESS OF 1000 LB. P.S.I. FOR WOOD.

STANDARD SINGLE WRAP TRACTION FREIGHT ELEVATOR

HANDROPE CONTROL

LAYOUT No. HTB 500

OTIS-FENSOM ELEVATOR COMPANY LIMITED

TORONTO - CANADA

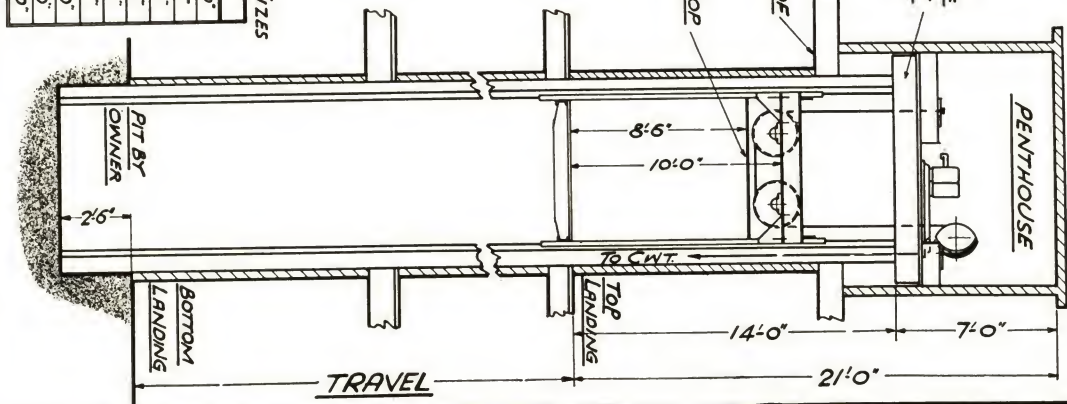
STANDARD CAR SIZES

A	B
8'0"	16'0"
8'0"	17'0"
8'0"	18'0"
8'0"	19'0"
8'0"	20'0"
8'0"	21'0"
8'0"	22'0"
8'0"	23'0"
8'0"	24'0"

4:1 OF SINGLE WRAP TRACTION MACHINE DUTY

2:1 HITCH

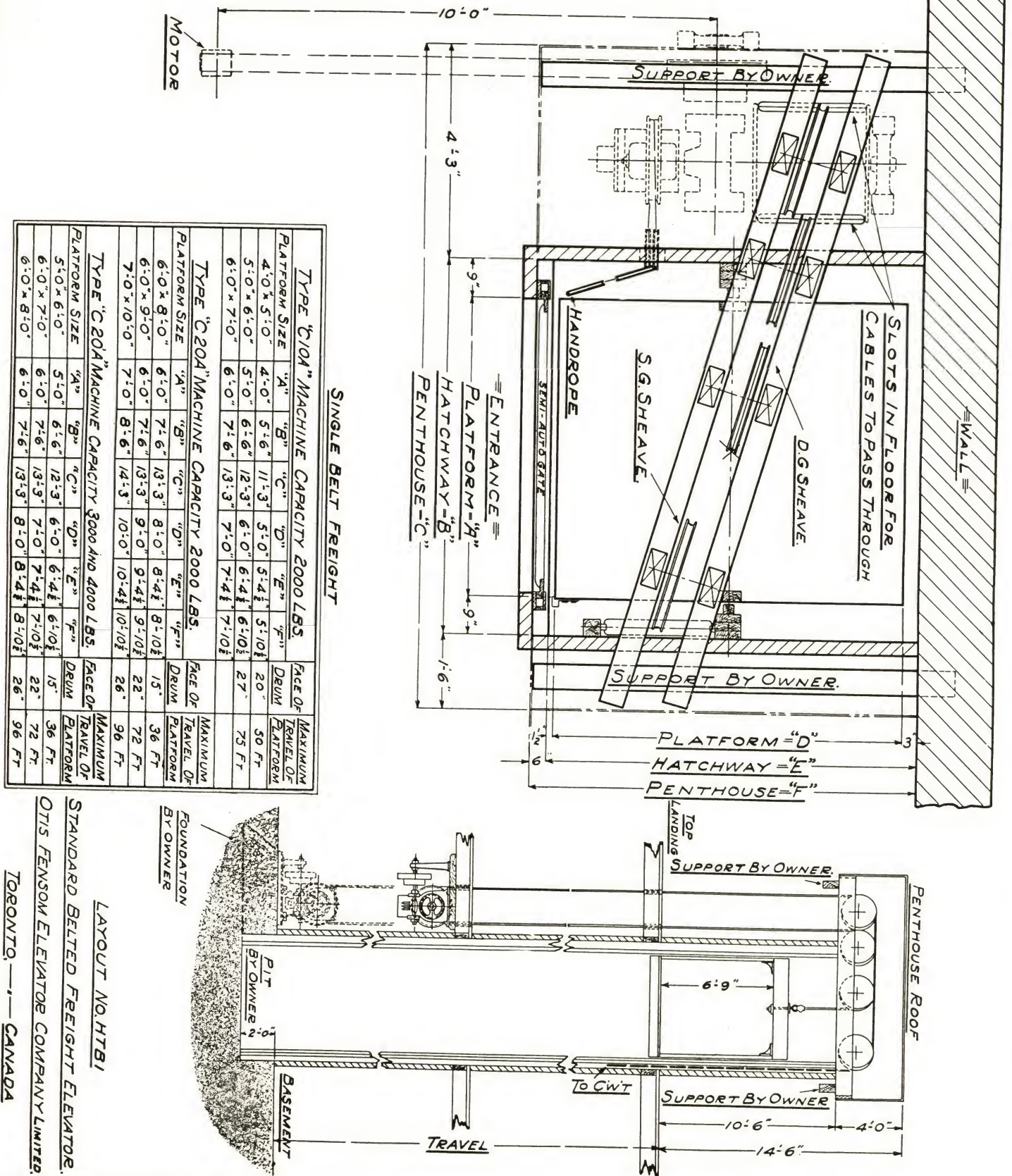
CURRENT A.C. & D.C. LOAD 4000 LB. AT 25 F.P.M.
CURRENT A.C. 25 C.T. LOAD 5000 LB. AT 15 F.P.M.
CURRENT A.C. 60 C.T. & D.C. LOAD 5000 LB. AT 20 F.P.M.



NOTE: BEAMS &
FLOORING ARE BY
OWNER.

No. HTB 500

OTIS-FENSOM ELEVATOR COMPANY, LIMITED

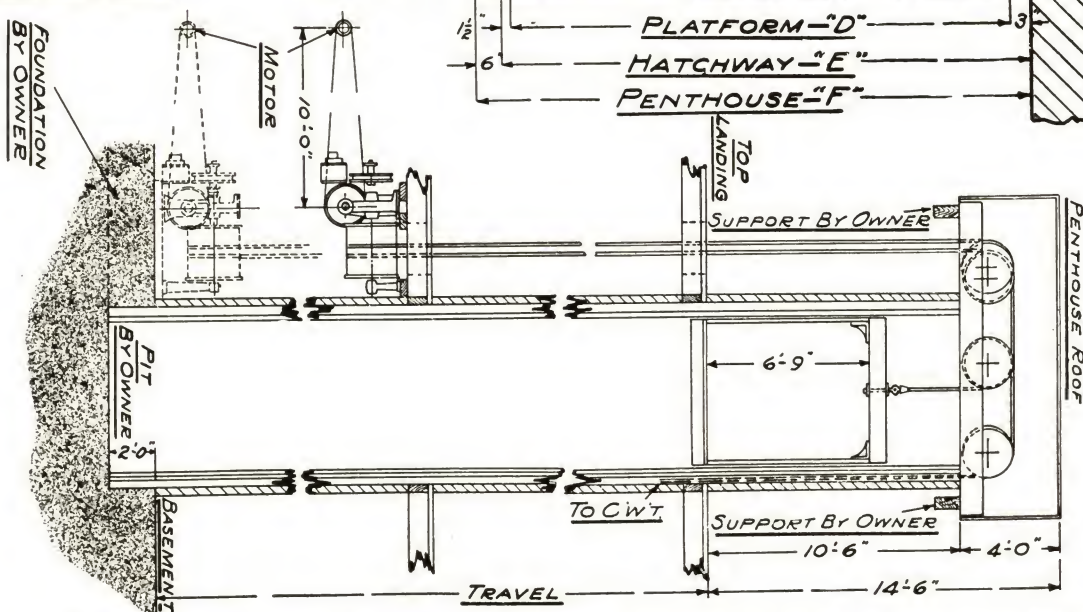
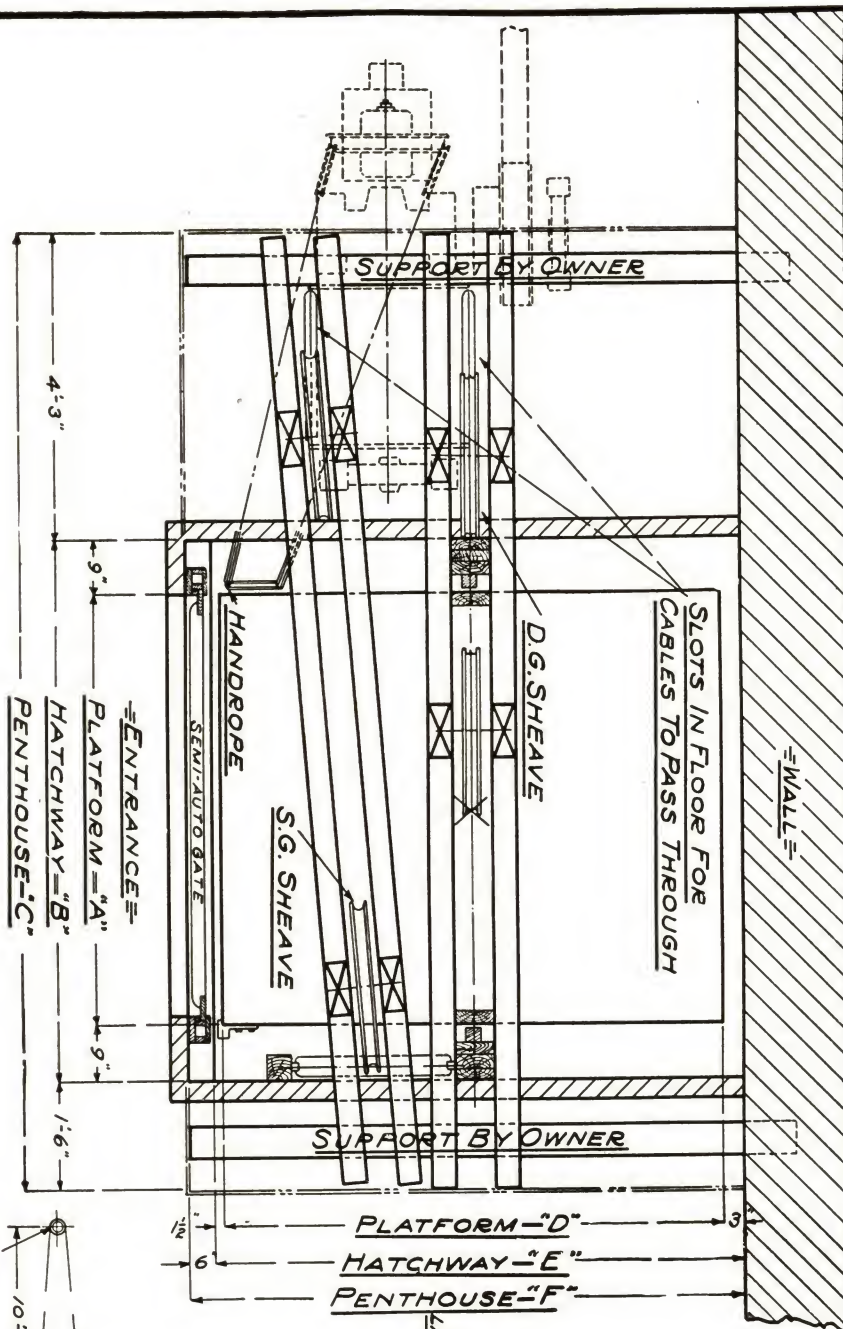


No. HTB1

OTIS-FENSOM ELEVATOR COMPANY, LIMITED

TYPE "C10A" MACHINE CAPACITY 2000 LBS.									
PLATFORM SIZE	"A"	"B"	"C"	"D"	"E"	"F"	FACE OF DRIVE	MAXIMUM TRAVEL OF PLATFORM	
4'-0" x 5'-0"	4'-0"	5'-6"	11'-3"	5'-0"	5'-4"	5'-10"	20"	50 FT.	
5'-0" x 6'-0"	5'-0"	6'-6"	12'-3"	6'-0"	6'-4"	6'-10"	27"	75 FT.	
6'-0" x 7'-0"	6'-0"	7'-6"	13'-3"	7'-0"	7'-4"	7'-10"			
TYPE "C20A" MACHINE CAPACITY 2000 LBS.									
PLATFORM SIZE	"A"	"B"	"C"	"D"	"E"	"F"	FACE OF DRIVE	MAXIMUM TRAVEL OF PLATFORM	
6'-0" x 8'-0"	6'-0"	7'-6"	13'-3"	8'-0"	8'-4"	8'-10"	15"	36 FT.	
6'-0" x 9'-0"	6'-0"	7'-6"	13'-3"	9'-0"	9'-4"	9'-10"	22"	72 FT.	
7'-0" x 10'-0"	7'-0"	8'-6"	14'-3"	10'-0"	10'-4"	10'-10"	26"	96 FT.	
TYPE "C20A" MACHINE CAPACITY 3000 AND 4000 LBS.									
PLATFORM SIZE	"A"	"B"	"C"	"D"	"E"	"F"	FACE OF DRIVE	MAXIMUM TRAVEL OF PLATFORM	
5'-0" x 6'-0"	5'-0"	6'-6"	12'-3"	6'-0"	6'-4"	6'-10"	15"	36 FT.	
6'-0" x 7'-0"	6'-0"	7'-6"	13'-3"	7'-0"	7'-4"	7'-10"	22"	72 FT.	
6'-0" x 8'-0"	6'-0"	7'-6"	13'-3"	8'-0"	8'-4"	8'-10"	26"	96 FT.	

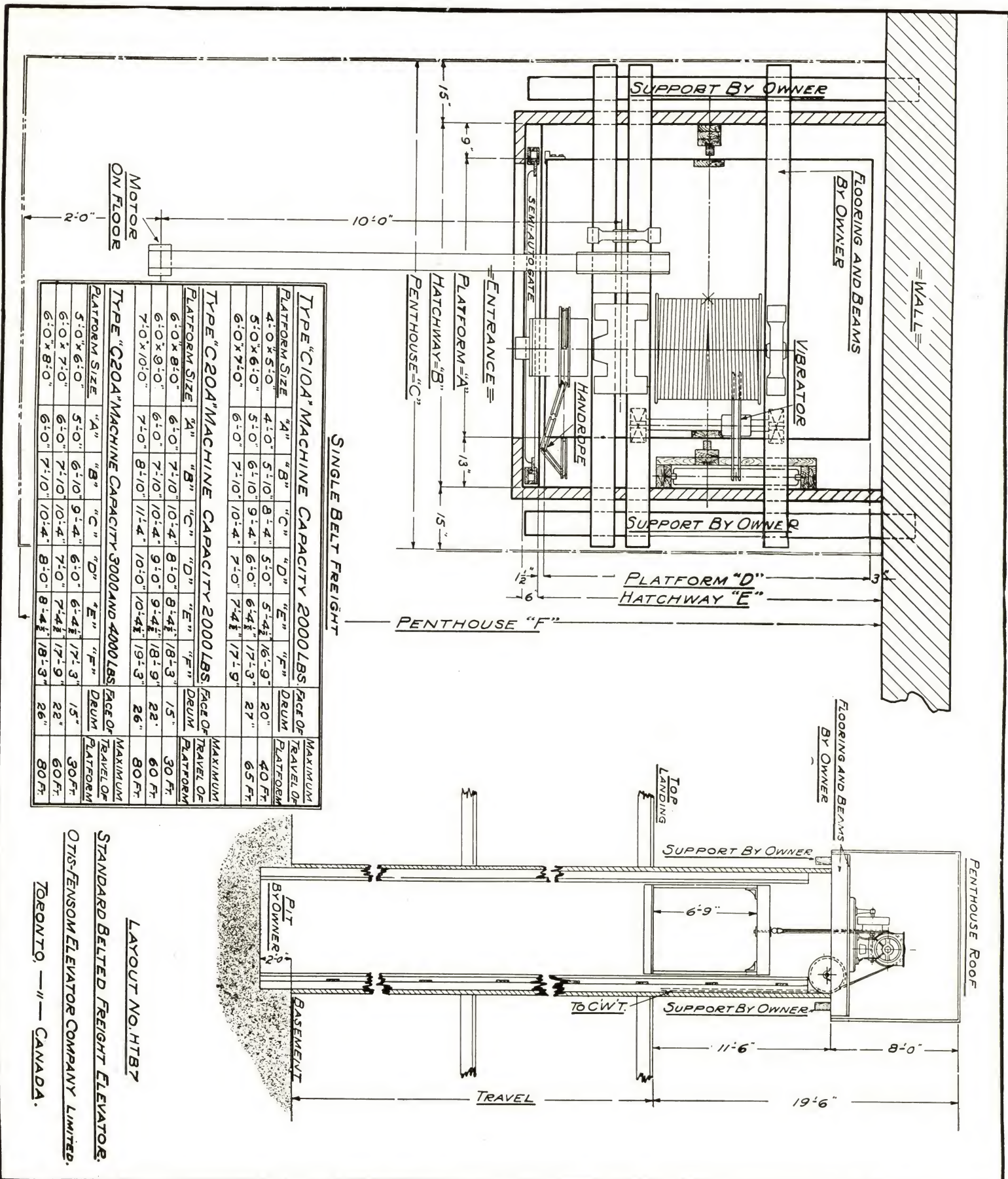
SINGLE BELT FREIGHT



No. HTB3

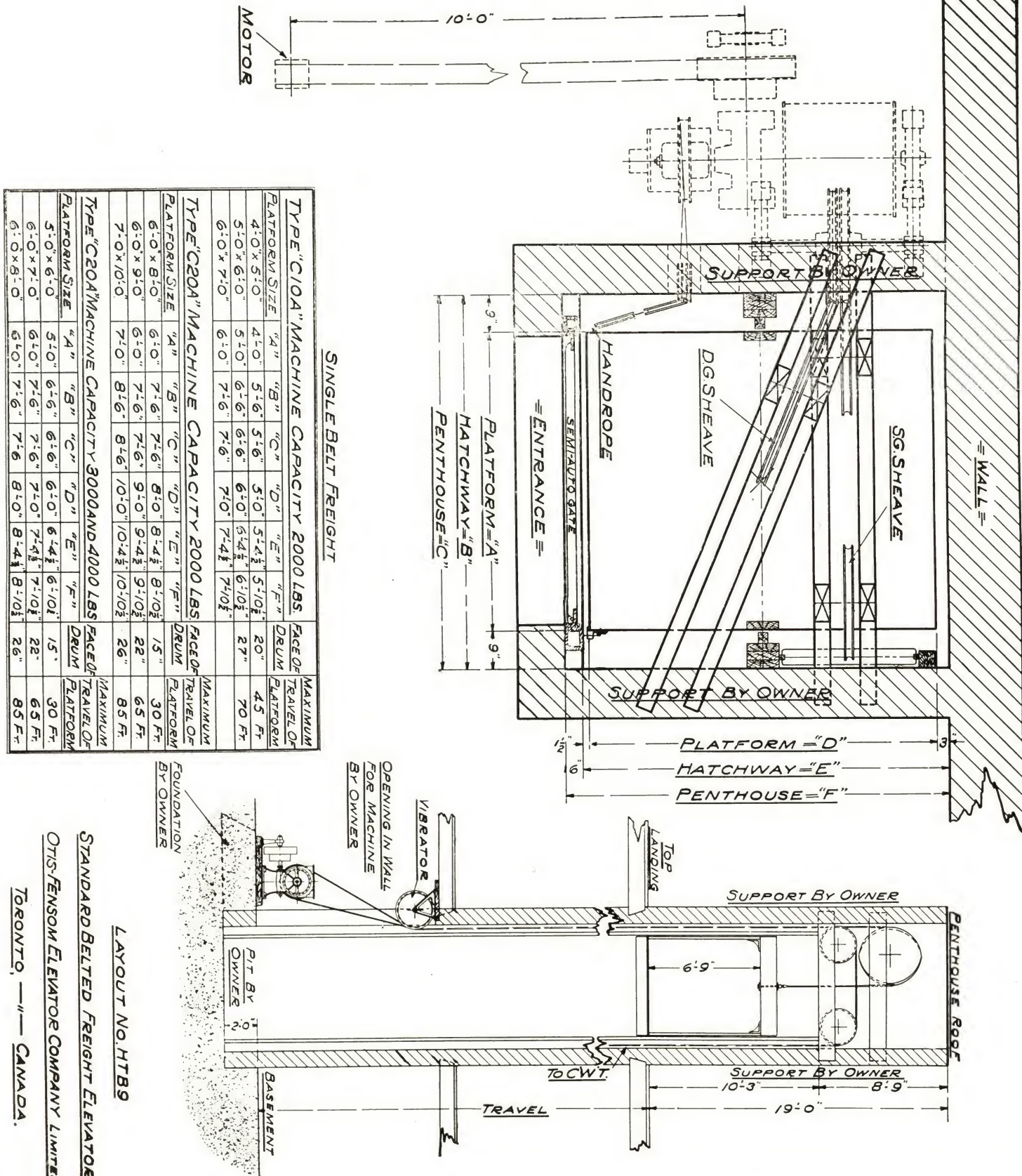
LAYOUT NO. HTB3
STANDARD BELTED FREIGHT ELEVATOR.
OTIS-FENSOM ELEVATOR COMPANY LIMITED.
TORONTO, ——— CANADA.

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



No. HTB7

OTIS-FENSOM ELEVATOR COMPANY, LIMITED



No. HTB 9

THE TURNBULL ELEVATOR COMPANY, LIMITED.

HEAD OFFICE AND WORKS
JOHN STREET, TORONTO.

EASTERN BRANCH
MAPPIN BUILDING, MONTREAL.

WESTINGHOUSE-TURNBULL

HIGH SPEED GEARLESS TRACTION ELEVATORS.

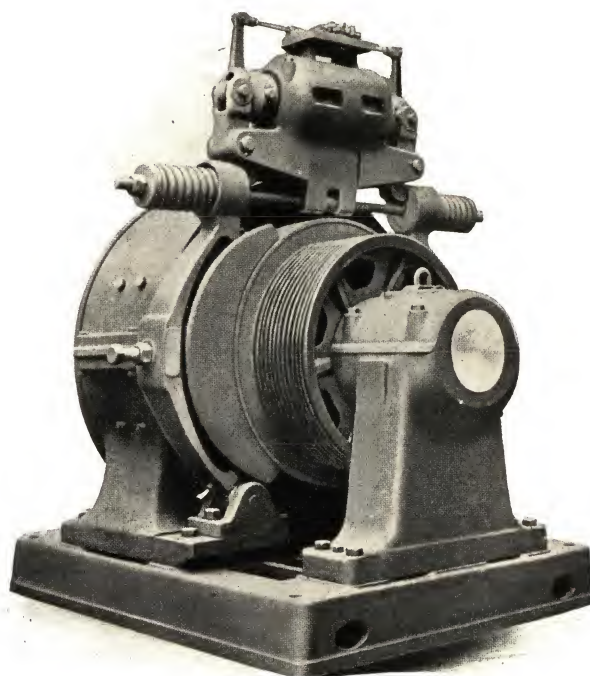


ILLUSTRATION.

The Turnbull Elevator Company Limited co-operating with the Westinghouse Electric Company invite the attention of Canadian Architects, Engineers and Contractors to their high class Gearless Traction Elevator Equipment designed and built to meet the most exacting demands of high speed elevator service. Hundreds of these machines as illustrated above are in daily operation.

OTHER TYPES TURNBULL ELEVATORS

Worm gear Traction Elevators, Passenger and Freight Elevators for every service—car switch or push button control—A.C. or D.C.—Electric Dumb Waiters—Elevator Cabs and Enclosures.

HALIFAX OFFICE:
3 Simson Bldg.
J. A. THOMPSON, Manager.

OTTAWA OFFICE:
71½ Sparks Street.
CHARLES V. CLARK, Manager.

TORONTO OFFICE:
77 York Street.
H. J. CHURCH, Manager.

DARLING BROTHERS LIMITED

ENGINEERS,
MANUFACTURERS AND FOUNDERS.

HEAD OFFICE AND WORKS:

120 PRINCE STREET, MONTREAL, P.Q.

QUEBEC OFFICE: 203 St. John Street. W. J. BANKS, Agent.

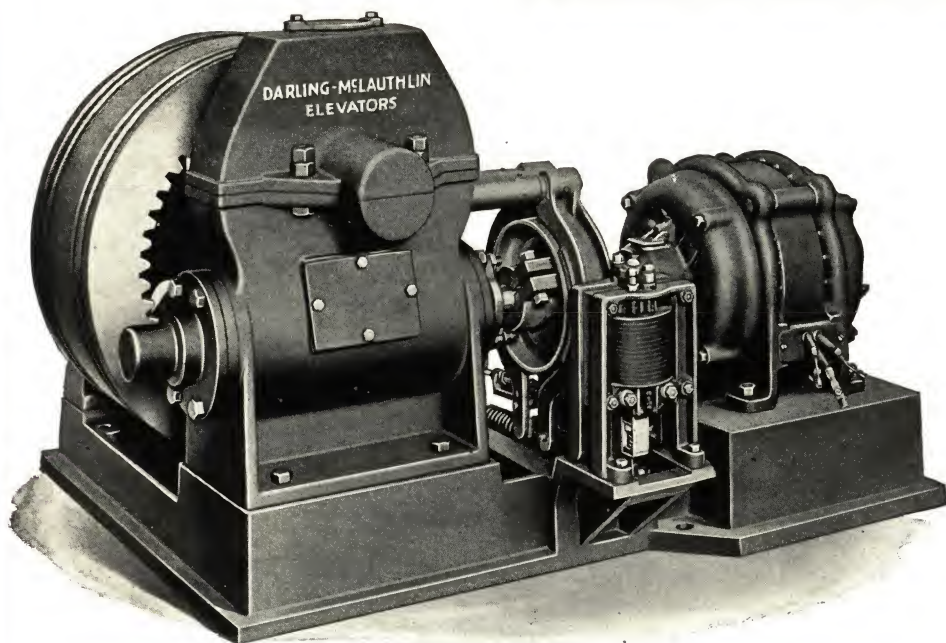
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NO. AA—DIRECT CONNECTED TRACTION TYPE INTERNAL GEARED ELECTRIC ELEVATOR MACHINE.

FREIGHT ELEVATORS.

We manufacture Elevators and Dumb-waiters, Electric, Hydraulic, Belt Driven or Hand Power for any Service.

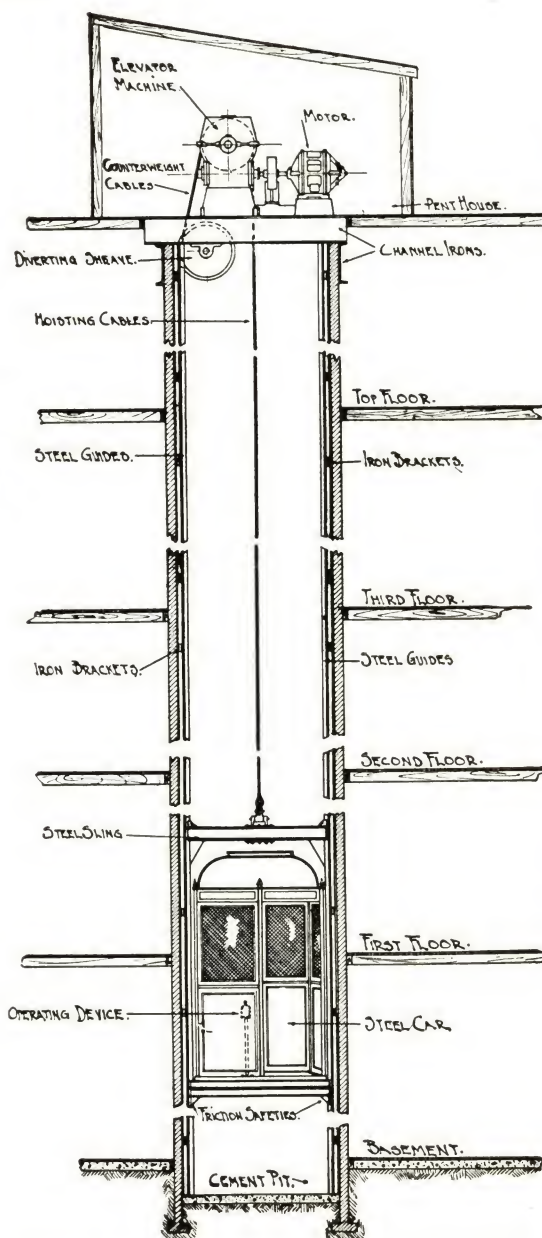
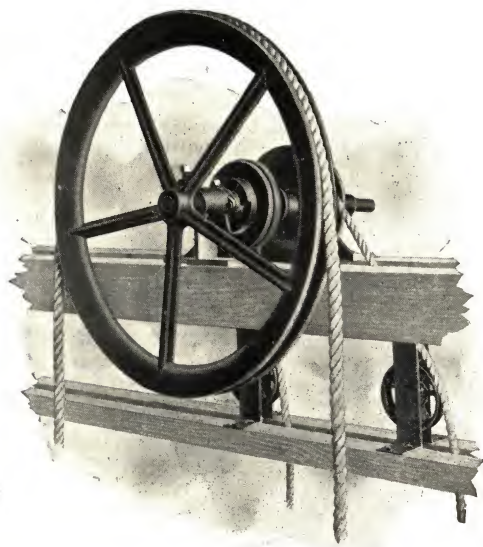
Thirty-four years of Manufacturing and Elevator experience.

Our Elevator Catalogue will be sent on request.

We have competent Engineers at our Head and Branch offices, who will be glad to give information and take care of enquiries.

NO. 1. AUTO- MATIC BRAKE DUMB WAITER MACHINE.

100 LBS CAPACITY FITTED
WITH ROLLER BEARINGS
SUITABLE FOR HOUSE OR
SMALL APARTMENTS.



TYPICAL LAYOUT OF STANDARD PASSENGER ELEVATOR WITH
CAR SWITCH CONTROL.

Traction Elevator Machines and typical installation layout shown above are of the very latest design. This particular type of Machine is being generally recommended by all Elevator Manufacturers for giving the best Service as regards Safety, Capacity, Efficiency and Durability.

See also our advertisements on Mason Safety Treads, page 123 and Steam Specialties and "Whitlock-Darling" Heaters, pages 216-217.

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ARCHITECTURAL BRONZE WORK AND IRON WORK OF ALL KINDS.



This solid Bronze Store Front situated on Yonge St., Toronto, was specially designed and executed by us for Milton's Limited. It is a good example of the trend of modern commercial selling whereby a good shop front acts as a worthy and attractive frame for the goods on view. We are specialists in designing such metal work in conformity with your individual requirements and thereby, produce something which is really exclusive.

BRONZE.

Monumental Doors.
Grille Doors and Grilles.
Bank Railings and Cages.
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Revolving Door Enclosures.
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Entrances and Windows.
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Polished Steel Vault Grilles.
Elevator Enclosures and Cabs.
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International Steel Casements.
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CATALOGUE.

Architects, please send for our illustrated catalogue, which gives an idea of the style and scope of work we have actually executed.

See also our advertisement, page 240.

SNEAD & CO. IRON WORKS, LIMITED

(FOUNDED IN 1849)

250 RICHMOND ST. WEST,
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PRODUCTS.

SNEAD STANDARD STACK.

SOLE MAKERS OF THE SNEAD STANDARD STACK, GREEN-SNEAD BOOKSTACK, SNEAD NEWSPAPER STACK, AND METAL SHELVING FOR LIBRARIES.

THE SNEAD STANDARD STACK is installed in the Parliamentary Libraries of Ontario, Saskatchewan, Alberta, British Columbia, Manitoba, the Library of Congress at Washington, the New York Public Library, etc. The simple construction fits it for use, not only in large, but also in smaller libraries, with but a single or a few stack tiers (stories), and also for offices and private libraries requiring merely plain wall shelving. The interchangeability of parts and the adaptable construction allows the stack, in case of remodelling, to be reset and extended both horizontally and vertically. Stack consists of solid or open work cast iron and steel uprights extending full width of ranges and spaced shelf length apart by fixed shelves at top and bottom. The adjustable shelves are preferably of the special OPEN BAR construction, light, strong, resilient and with dust-collecting surfaces reduced to a minimum. The uprights are each the height of one tier and may be bolted one above the other to obtain a stack of any number of stories. The uprights (Intermediate Upright in section) occupy no available book room, and are entirely free from dirt and dust-collecting hollow spaces. Deck floors or galleries between tiers give direct access to all shelves. The distance between the main floors of the building should be an even multiple of the stack tier height (preferably 7 ft. or 7 ft. 6 in.) so as to line up the main building floors with the stack deck floors. The deck floor construction is carried by the uprights and firmly anchored to the walls of the stack room. Floors of rooms above (without concentrated loads) are economically carried on stack construction. Cover plates at top protect books from dust and injury, and cornice gives a neat finish. Open work construction of uprights and shelves, and slits in the deck floors allow stack to be heated and ventilated as one great room. The system can be adapted to meet any requirements of architectural plan and design.

Adjustable shelves are completely finished at shop with baked black rubber japan. Fixed metal parts are preferably finished after erection with air drying enamel; baked enamel is unsuitable, as it cannot be renewed in place. Maximum distribution of light is obtained by using open work construction where possible and finishing fixed parts in a light shade, preferably French gray.

STANDARD STACK DIMENSIONS.

Shelf widths—For books, 8, 9, 10 and 12 in.; newspapers, 18 and 22 in. Shelf lengths—3 ft. usual—varied to suit conditions. Tier heights—7 ft. and 7 ft. 6 in. Aisle widths—Main, 2 ft. 6 in. to 5 ft.; minor, about 28 in. minimum; 30 to 36 in. average.



F. W. SIMON, Architect.

NEW PARLIAMENT BUILDINGS
WINNIPEG, MANITOBA.

W. J. HEALEY, Librarian.

View showing three tier Snead "Standard" bookstack in library, equipped with solid panelled ends and "open bar" adjustable shelves. The second deck floor is of steel plate construction covered with cork carpet. The electric conduits are concealed in steel mouldings forming the ceiling panels.

The storeroom and newspaper stack rooms in basement are also equipped with Snead "Standard" stacks.

TYPICAL INSTALLATIONS.

Ontario Legislative Library, Toronto, Ont.
Manitoba Legislative Library, Winnipeg, Manitoba.
British Columbia Legislative Library, Victoria, B.C.
Alberta Legislative Library, Edmonton, Alberta.
Saskatchewan Legislative Library, Regina, Saskatchewan.
Toronto Public Reference Library, Ontario.
Montreal Public Library, Montreal, Quebec.
Victoria College Library, Toronto, Ontario.
Knox College Library, Toronto, Ontario.
Bibliotheque St. Sulpice, Montreal, Quebec.

Dalhousie University Library, Halifax, N.S.
McGill University Medical Library, Montreal, Que.
Hamilton Public Library, Ontario.
Calgary Court House Law Library, Alberta.
Edmonton Court House Law Library, Alberta.
Ottawa Public Library, Ontario.
Calgary Public Library, Alberta.
Moose Jaw Public Library, Saskatchewan.
Regina Public Library, Regina, Saskatchewan.
Fort William Public Library, Fort William, Ont.
Tillsonburg Public Library, Ontario.

SERVICE.

We are the pioneers in the manufacture of Library Bookstacks. Our experienced stack designers are at the service of architects planning stack installations. Technical information relative to prices, capacities, stack dimensions, weights, etc., furnished free on request. Catalogue of 271 pages, giving plans and illustrations of library buildings, forwarded free of charge in connection with definite inquiries.

STANDARD STACK WEIGHTS.

Uprights and shelves, 7 to 10 lbs. per cu. ft. of range. Books, 20 to 25 lbs. per cu. ft. of range. Deck framing, 5 lbs. per sq. ft. Deck flooring, $\frac{3}{4}$ in. glass, 10 lbs. per sq. ft. Deck flooring, $1\frac{1}{4}$ in. marble, 18 lbs. per sq. ft.

THE DENNIS WIRE & IRON WORKS CO., LIMITED

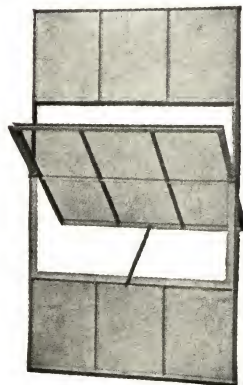
HEAD OFFICE AND WORKS:

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WINNIPEG, CALGARY, EDMONTON, VANCOUVER.



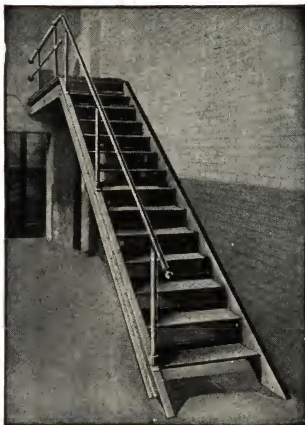
D. 45.
STANDARD DENNISTEEL WARDROBE
LOCKER, WITH SHELF, COAT HOOKS,
UMBRELLA STAND, AND LONG LOUVRE
VENTILATION.



"BOCA" SOLID STEEL SASH.



D. 105.
GOLF CLUB LOCKER.



IRON STAIRS FOR POWER PLANTS,
FACORIES, ETC.



WIRE STOCKROOM ENCLOSURE, FORD MOTOR CO.



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WE ALSO MAKE

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EQUIPMENT

GENERAL
BUILDERS'
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Stationery and Material Cabinets, Bins,
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Stools.

Spiral Stairs, Balconies, Railing, Grilles, Steel
Beams, Columns and Lintels, Pipe Railing, Area
Gratings, Sidewalk Doors, Wheel Guards, etc. etc.

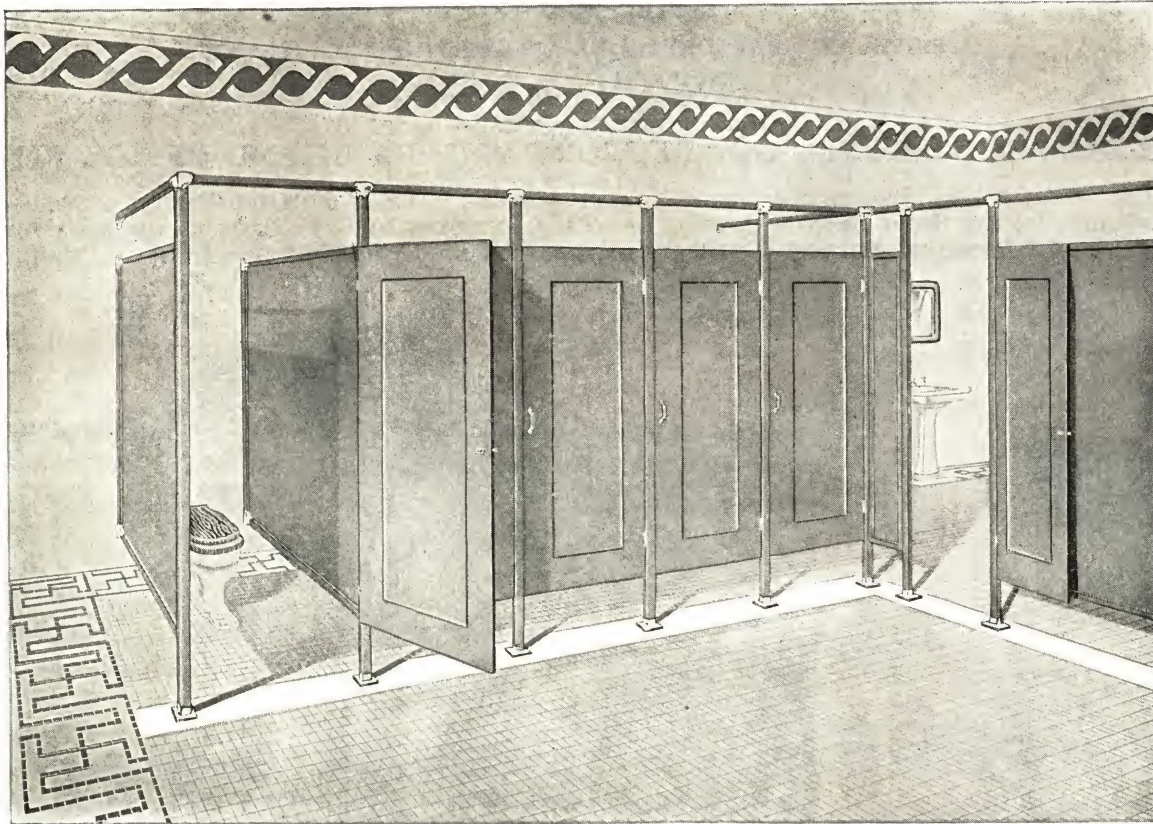
Write for folders.



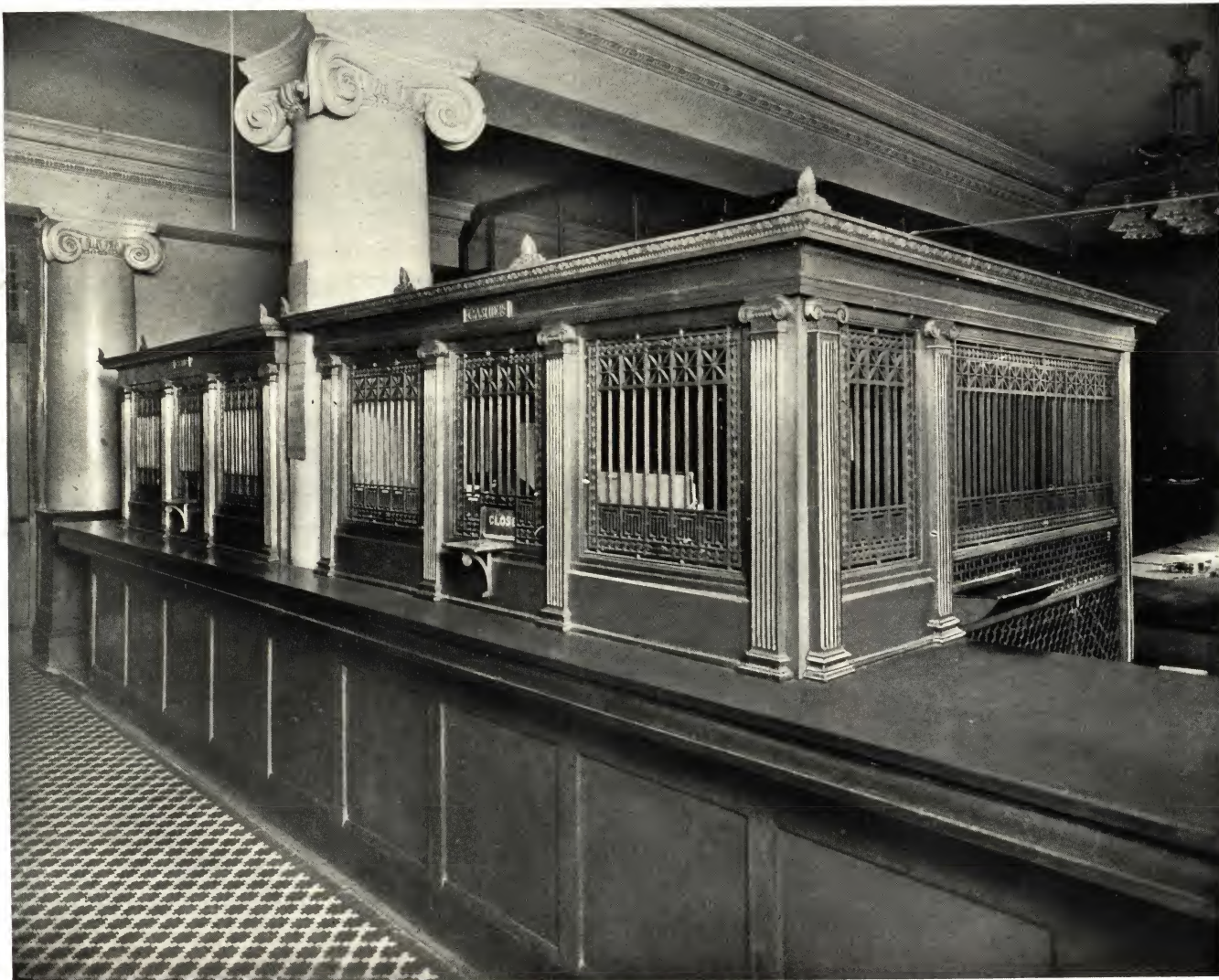
STANDARD STEEL SHELVING,
UNIT CONSTRUCTION.

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THE ROBERT MITCHELL CO., LIMITED

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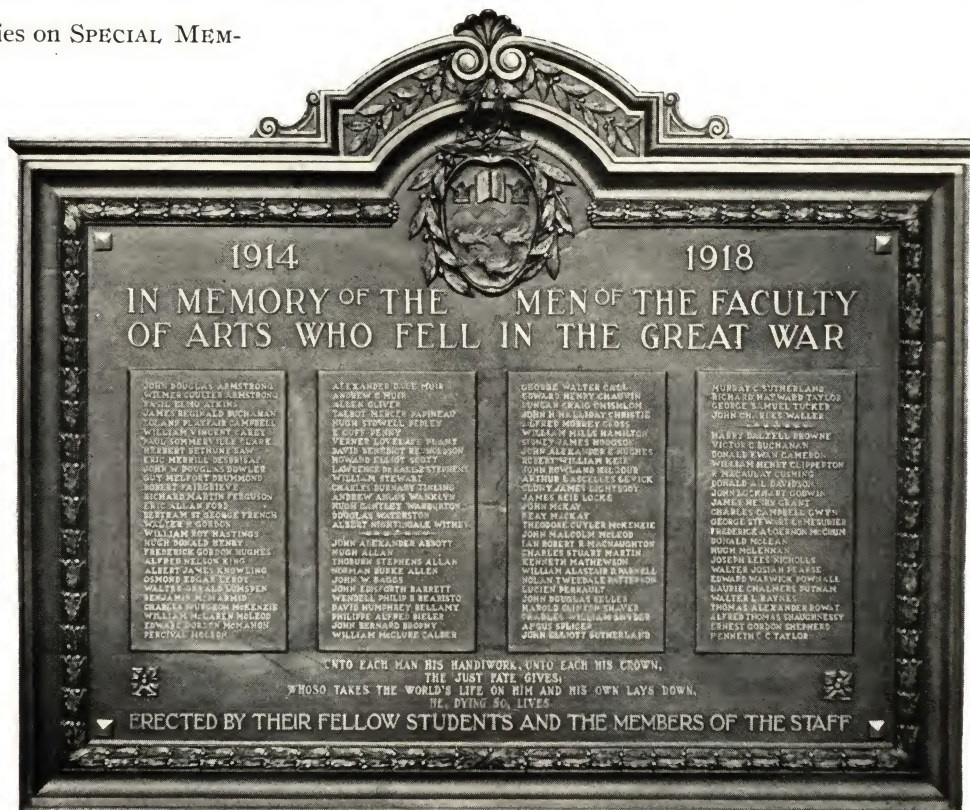
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JOHN WATSON & SON OF MONTREAL, LIMITED

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—Notre ouvrage en bronze pour architecture et ornementation comprend: Escaliers, balustrades, grillages, piédestals, entourages d'elevateur, grillages pour comptoirs de banque, echelles de sauvetage, etc. etc.

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ARCHITECTURAL AND ORNAMENTAL BRONZE WORK, including:—STAIRS; RAILINGS; MARQUISES; ENTRANCES; WIRE WORK; COUNTER-BALANCED FREIGHT DOORS; HAMMERED LEAF WORK; LAMP STANDARDS; ELEVATOR ENCLOSURES; BANK COUNTER SCREENS; FIRE ESCAPES; FINE CASTINGS a specialty; BUILDING SPECIALITIES—Bases, Caps, Inserts, Hangers, etc.

Building Specialities, including Steel Joist and Wall Hangers, Cast Iron Post Caps and Bases, Wall Boxes, Pile Points, Sash Weights, Safety Treads and Counter-Balanced Freight Doors, also Ornamental Iron of every description.

FACILITIES.

Our works are most complete in every detail, including foundries, shops, designing and modelling departments, which enables us to do the work in the most skilled manner.

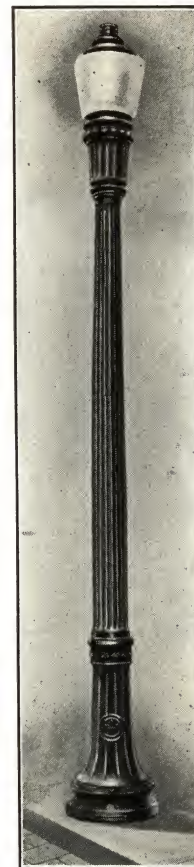
WATSON'S COUNTER-BALANCED FREIGHT DOORS.

We have been making and erecting these doors for the last 18 years, so they are no experiment. Stronger, more durable, than any door we know of; approved of by the Fire Underwriters. Easy to operate, installed on shaft side. Prompt delivery, no waiting outside of necessary time for manufacture. Our expert workmen are at your service at all times.

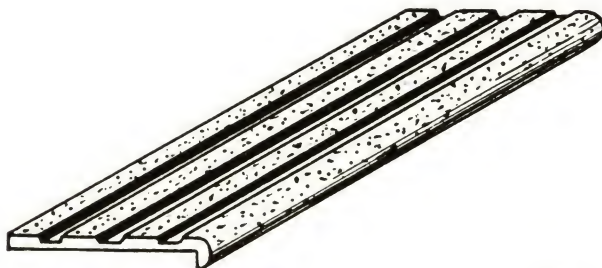
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Designed for hard service as well as efficiency. Made in Canada. Just as good as foreign made treads, cheaper, better delivery, and will outwear the ordinary safety tread.

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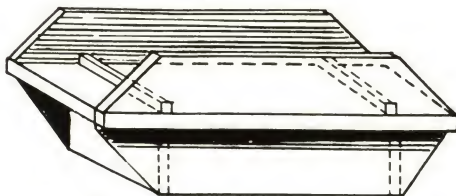


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DESIGNED AND ERECTED
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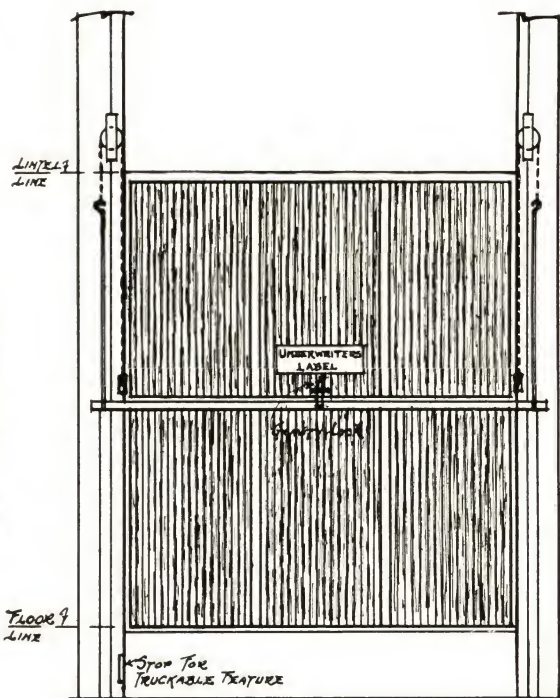
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WATSON'S ARMOUR PIERCING PILE POINTS are well finished, easily fastened to pile, made of special metal, better than imported points and just as cheap.



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We have a special Hammered Iron Work Department in which we have produced some of the finest examples of Artistic Fire Doors, Lighting Fixtures, etc., for high-class residences.

"MODERN METHOD" STAIRS.

We specialize on "Modern Method" stairs, which have been installed in many of the modern buildings throughout Canada and are specified by leading architects.

They are manufactured by machinery specially designed and, therefore, can be made and erected in less time than any other style of stairs. They are the neatest, lightest and strongest stairs made.



BRONZE STAIR RAILING INSTALLED IN THE IMPERIAL BANK BUILDING, CORNER OF QUEEN AND YONGE STREETS, TORONTO, ONT.
DARLING & PEARSON, Architects.

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Our Factory is devoted exclusively to the production of Ornamental Iron and Bronze Work. It is equipped with every facility for the manufacture of work of the best grade, and a well-organized staff of skilled designers and workmen enables us to promptly execute any work entrusted to us, no matter how large or small the contract may be.

We solicit enquires and plans from Architects and Builders on special work from their own details. Architects' details are carried out with the utmost accuracy, thus ensuring execution of the work in clean, sharp detail.

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The following are some of the more important contracts we have executed:

DOMINION BANK, Queen and Bay Streets, Toronto, Ont.....	Darling & Pearson, Architects.
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KING EDWARD HOTEL, Toronto, Ont.....	Esenwein & Johnson, Architects.
TECHNICAL SCHOOL, Toronto, Ont.....	Ross & Macdonald, Architects.
HUNTER BUILDING, Ottawa, Ont.....	Public Works Dept., Ottawa.
GOVERNMENT HOUSE, Toronto, Ont.....	Provincial Architect, Toronto.
ALBERTA PARLIAMENT BUILDING, Edmonton, Alta.....	Provincial Architect, Edmonton.
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MANUFACTURERS OF

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PRODUCTS OF STEEL.

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FOUR DRAWER BLUE-PRINT CABINET

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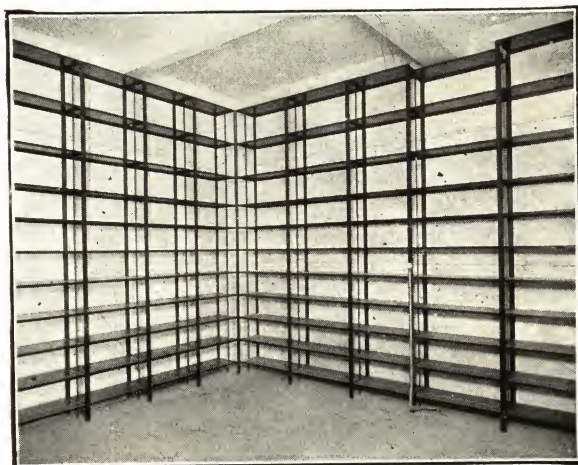
Meadows' experienced and skilled workmen are at your service in designing, estimating, executing, serving and giving prompt delivery on quality products.

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TUTTLE & BAILEY MFG. CO. OF CANADA, LTD.

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REGISTERS, VENTILATORS, GRILLES AND SCREENS OF STOCK OR SPECIAL DESIGNS IN BRONZE, BRASS, CAST IRON, STEEL OR WIRE.

CAST GRILLES (STOCK DESIGNS)

Bronze or cast iron grilles have rims which vary in width according to size, the thickness of the rim being less than that of the fretwork.

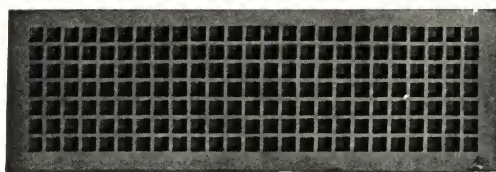
In the section shown in the opposite column, A is the body size or size of opening to be covered; B is the extreme outside measure and C the daylight opening. Unless otherwise stated, it is assumed that sizes given on orders are body sizes "A".

Plain lattice cast grilles are made in almost all sizes (body sizes) of even inches. The mesh is $\frac{7}{8}$ in. square and the bars approximately $\frac{1}{4}$ in.

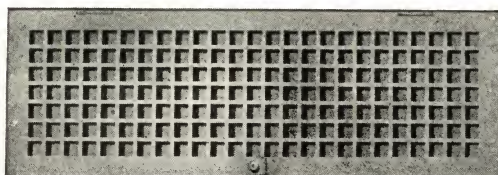
Various methods of fastening these grilles and providing means of access to steam valves or for cleaning purposes are shown. Any of the special design grilles can be similarly arranged.

Estimates for providing hinges and catches of the special frames shown will be sent on application.

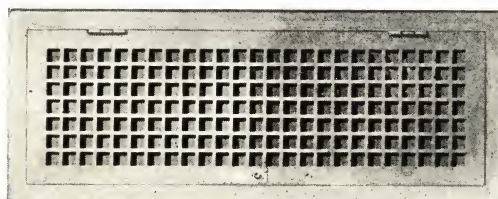
Supplied in any finish desired.



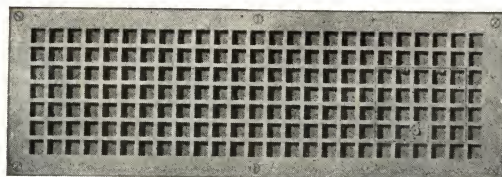
STANDARD $\frac{7}{8}$ -IN MESH GRILLE



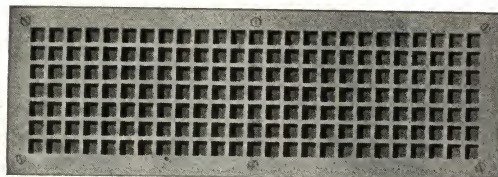
GRILLE HINGED TO WOODWORK



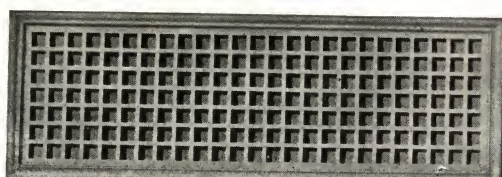
GRILLE HINGED TO ANGLE FRAME



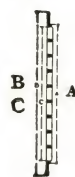
GRILLE WITH DOOR IN FRETWORK



GRILLE ATTACHED TO IRON WALL FRAME



GRILLE HELD IN PLACE BY WOOD MOULDING
CAST GRILLES



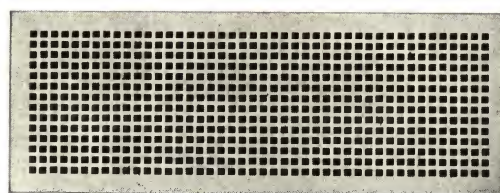
STEEL GRILLES (STOCK DESIGNS)

While not as substantial in appearance or as lasting as cast iron, steel grilles are cheaper, and have their uses under certain conditions.

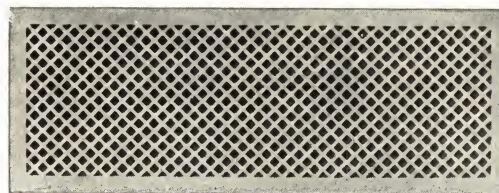
They are made of sheet steel, in any width or length, perforated in $\frac{7}{8}$ -in. or $\frac{1}{2}$ -in. mesh, with bars $\frac{1}{4}$ -in. wide. The $\frac{7}{8}$ -in. mesh is standard and is always supplied unless otherwise specified, but this company also makes $\frac{1}{2}$ -in. mesh in both square and diagonal lattice.

When ordering steel grilles, give dimension "B" as shown in section below (extreme outside dimension). Dimension "C" (daylight opening) is fixed according to dies and rims will be approximately 1 in. all around.

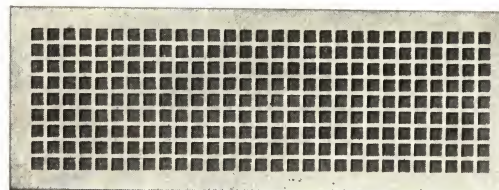
Supplied in any finish desired.



$\frac{1}{2}$ -IN. SQUARE MESH



$\frac{1}{2}$ -IN. DIAGONAL MESH



STANDARD $\frac{7}{8}$ -IN. SQUARE MESH
STEEL GRILLES



TUTTLE & BAILEY MFG. CO. OF CANADA, LIMITED.

BUILT-IN GRILLE ENCLOSURES.

Radiators are emphatically obtrusive, but there are ways of overcoming this obtrusiveness and adding to the attractiveness of the room.

Grille enclosures are the solution. They are either planned for and built in with the house or designed and added afterwards.

The illustrations on this page show a few examples of how easily and effectively any of the results can be accomplished.

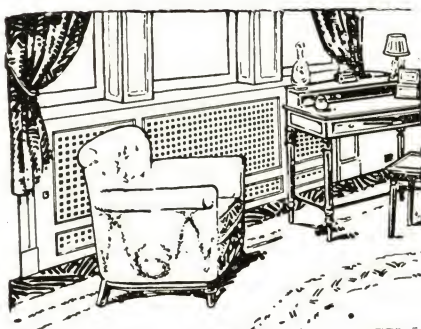
This company has a wide range of designs and sizes in grilles admirable for this purpose, ranging from the simple square barred ones to the elaborate ones of Greek motif, or if special grilles are desired, exclusive treatment will be made to suit the individual taste.

Catalogue of standard grilles will be sent to interested persons upon request.

Grilles can be furnished in any finish desired.

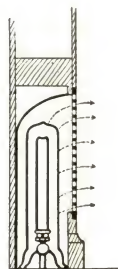
Whether it is proposed to obscure radiators with a window seat or to recess them in the wall or window enclosure, it should be borne in mind that the better the circulation of the air at the bottom and out at the top, the greater will be the utilization of the heat, thus grille openings at the top should be proportionate to those at the bottom.

In cases where top and bottom openings are not both possible (as in some window seats, certain recess locations and as in the case of utilizing the under part of a closet, as illustrated below), a curved sheet metal deflector should be installed as illustrated. This deflector throws the heat out and sets up a semi-circulatory circulation.



A BUILT-IN TREATMENT UNDER THE WINDOW.

Part recessed and part extending into the room. The effect is that of a deep window sill, adding an undeniable attractiveness.



Radiator Recessed in Wall, with Curved Heat Reflecting Sheet above it and Grille in front.



Radiator Placed under Closet as shown below.



Built in Enclosure Extending into Room.



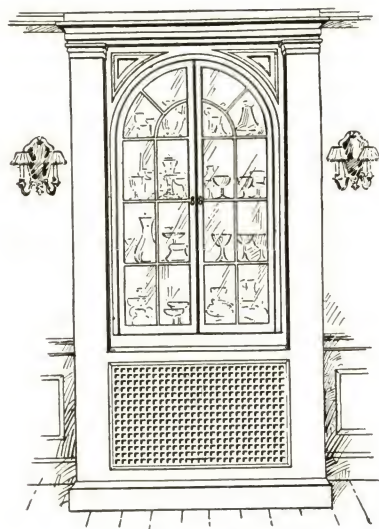
RECESSED ON EITHER SIDE OF FIREPLACE.

In this room, the recessed grilles are inconspicuous on either side of fireplace. Electroplated as the face of the grilles are, in the same tonal browns of the woodwork, the radiators are not noticeable.



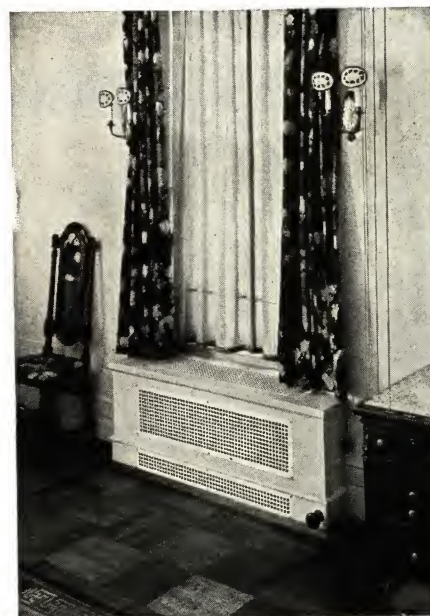
UNDER A DEEP SET WINDOW.

If windows are deep set, the enclosure can be ideally handled, becoming as it does a direct part of the general woodwork. Notice the practically unnoticeable grille inserts on the top.



UNDER A CHINA CLOSET.

A clever treatment in which the dining-room radiators are placed in the under part of a china closet. There being no top opening to insure circulation, a curved sheet metal deflector was used, as shown above. The grille can be easily removed for cleaning or any needed attention to the radiator. If radiator control is desired, an extension rod can be easily fastened to the valve and the handle placed behind the door on the first shelf. Grille is so skilfully placed that it is inconspicuous and would probably not be noticed unless attention was called to it.

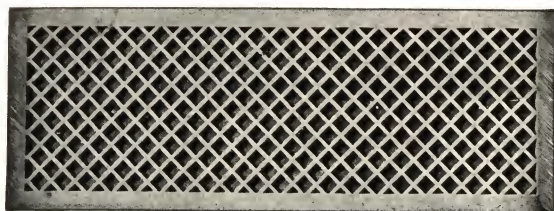


FOR FLUSH SET WINDOWS

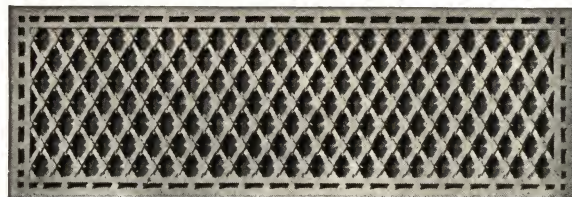
A charming enclosure adaptable to flush set windows. Note how the radiator is effectively screened, also note the radiator control. The grilles are finished to harmonize with the surroundings.

A FEW EXAMPLES OF BUILT-IN GRILLE ENCLOSURES.

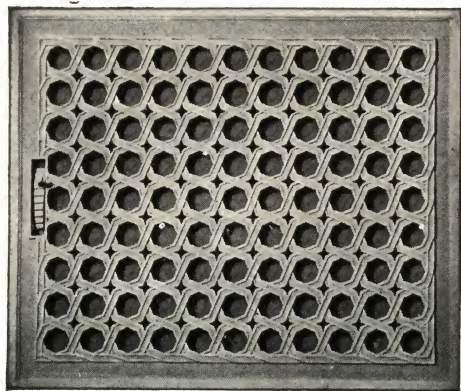
TUTTLE & BAILEY MFG. CO. OF CANADA, LTD.



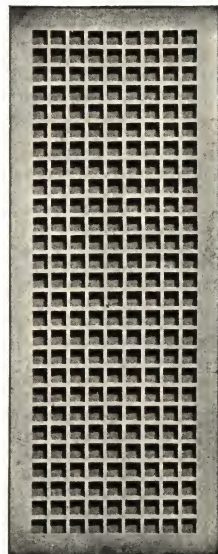
T. & B. 56.



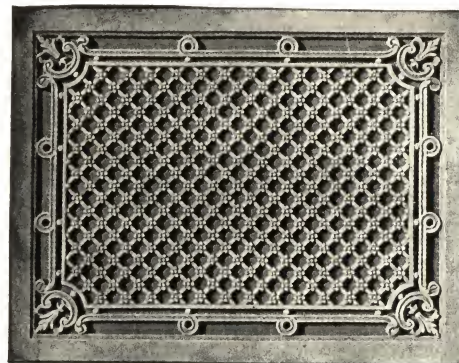
T. & B. 59.



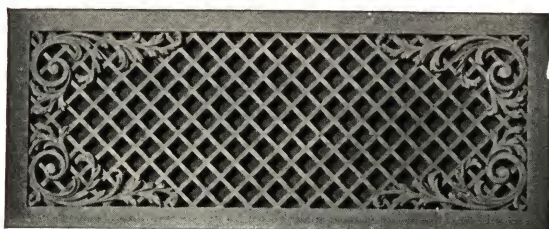
T. & B. 82.



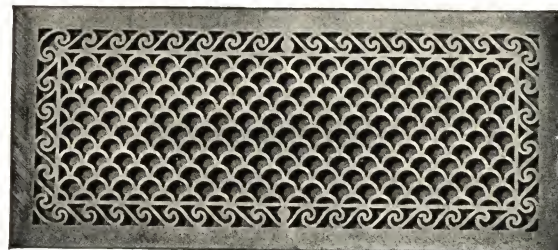
T. & B. 85.



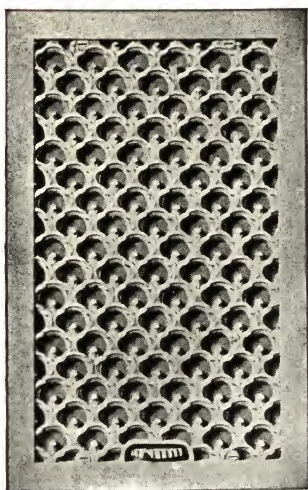
T. & B. 83.



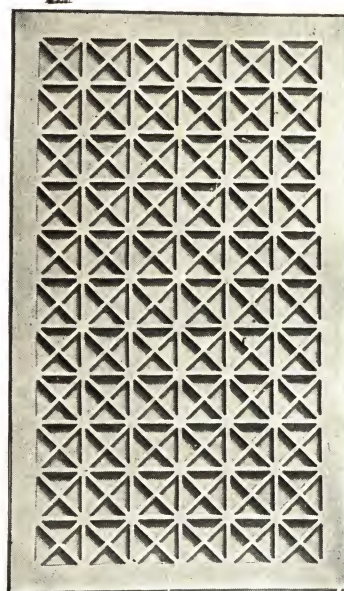
T. & B. 12.



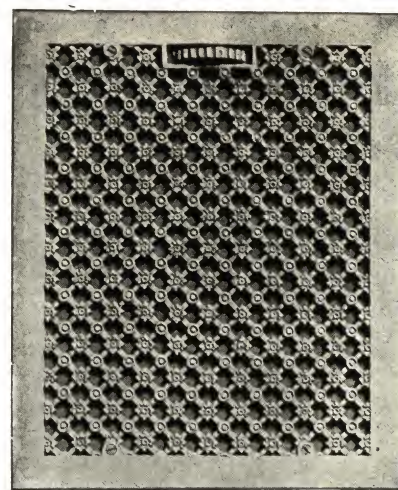
T. & B. 118.



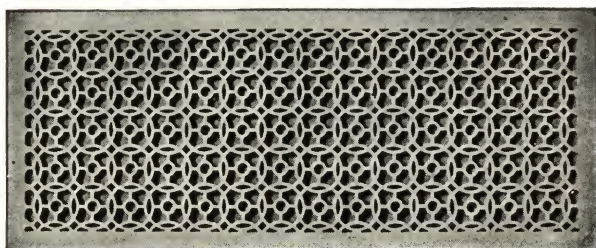
T. & B. 30.



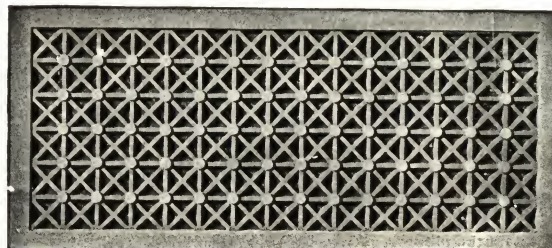
T. & B. 381.



T. & B. 80.



T. & B. 26.



T. & B. 42.

A FEW EXAMPLES OF REGISTERS, GRILLES AND SCREENS SELECTED FROM OVER 400 SPECIAL DESIGNS.
Made to order only, with an additional charge over the cost of stock goods.

HALIFAX OFFICE:
3 Simson Bldg.
J. A. THOMPSON, Manager.

OTTAWA OFFICE:
71½ Sparks Street.
CHARLES V. CLARK, Manager.

TORONTO OFFICE:
77 York Street.
H. J. CHURCH, Manager.

DARLING BROTHERS LIMITED

ENGINEERS,
MANUFACTURERS AND FOUNDERS.

HEAD OFFICE AND WORKS:
120 PRINCE STREET, MONTREAL, P. Q.

QUEBEC OFFICE: 203 St. John Street. W. J. BANKS, Agent.

WINNIPEG OFFICE:
104 Princess Street.
CHARLES A. SARGENT, Manager.

CALGARY OFFICE:
605 Second Street West.
S. S. CLARKE, Agent.

VANCOUVER OFFICE:
1144 Homer Street.
FRANK DARLING & CO. LTD., AGENTS.

MASON SAFETY TREADS WITH STEEL BASE.

STANDARD WIDTHS—ACTUAL SIZE.

Composed of a base of rolled, unperforated steel with dovetailed grooves filled with lead or carborundum.

MASON
SAFETY
TREADS
WITH STEEL
BASE.



Fig. 1. Cross Section, Steel, 7 ribs, 6 inches wide.



Fig. 2. Cross Sections, steel, 5 ribs, 4¾ inches wide.



Fig. 3. Cross Section, steel, 5 ribs, 4 inches wide.



Fig. 3A. Cross Section, steel, 4 ribs, 3¾ inches wide.

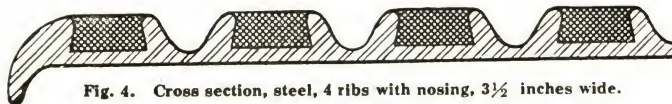


Fig. 4. Cross section, steel, 4 ribs with nosing, 3½ inches wide.

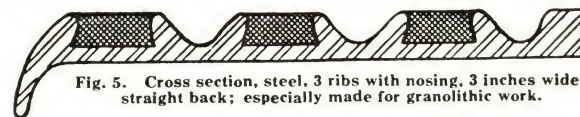


Fig. 5. Cross section, steel, 3 ribs with nosing, 3 inches wide, straight back; especially made for granolithic work.



Fig. 6. Cross Section, steel, 3 ribs, 2½ inches wide.

NOTE.—Mason Safety Treads of almost any desired width may be made from our standard widths as indicated above. The 3-inch nosing piece is intended for use with cork carpet, or for concrete and cement work, as it has a square back edge.

MASON SAFETY TREADS WITH BRASS BASE.

STANDARD WIDTHS—ACTUAL SIZE.

Base composed of hard brass (Delta Metal) with dovetailed grooves filled with lead or carborundum.

MASON
SAFETY
TREADS
WITH BRASS
BASE.



FIG. 7. CROSS SECTION.

Brass (Delta Metal) Base, 8 Ribs, 6" wide



FIG. 8. CROSS SECTION

Brass (Delta Metal) Base, 5 Ribs, 4" Wide



FIG. 9. CROSS SECTION
Brass (Delta Metal) Base, 4 Ribs, 3" Wide

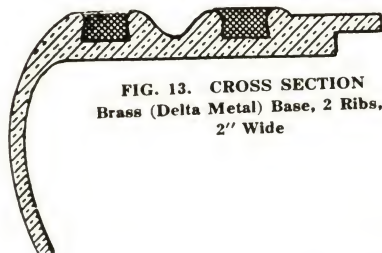


FIG. 13. CROSS SECTION
Brass (Delta Metal) Base, 2 Ribs,
2" Wide



FIG. 11. CROSS SECTION.

Brass (Delta Metal) Base, 4 Ribs, 3½" Wide



FIG. 12. CROSS SECTION
Brass (Delta Metal) Base, 3 Ribs, 2½" Wide

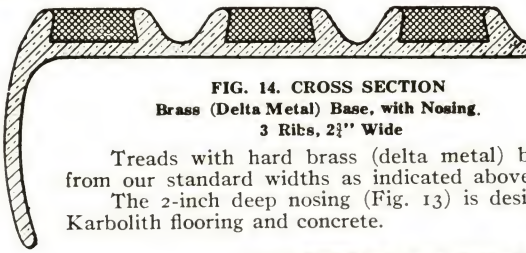


FIG. 14. CROSS SECTION
Brass (Delta Metal) Base, with Nosing,
3 Ribs, 2½" Wide

Treads with hard brass (delta metal) base of almost any desired width, may be made from our standard widths as indicated above.

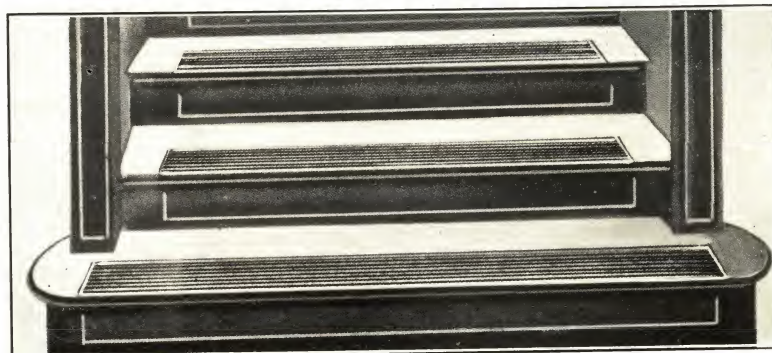
The 2-inch deep nosing (Fig. 13) is designated expressly for use with cork composition, Karbolith flooring and concrete.

MASON SAFETY
TREAD.

For use upon outer or inner stairs of granite, marble, slate, cement, iron or wood; upon old, partly worn, as well as new surfaces; upon thresholds of doors and elevators, fire doors, inclined passages, straight or curved, vault light borders, vault entrances, granolithic walks, ship ladders, the steps, running boards, platforms and vestibules of cars, around machinery where the presence of oil is dangerous, in trolley car barn pits, along the edges of platforms, and many other places.

Ask for Catalogue, Section 17.

See also our advertisement on Elevators page 111, and Steam Specialties and Whitlock-Darling Heaters pages 216-217.



MASON SAFETY TREAD ON IRON STAIRS.

THE SAFETY STAIR TREAD COMPANY, INC.

WOOSTER, OHIO

CANADIAN AGENTS:

DRUMMOND & REEVES, LTD.

43 JARVIS ST., TORONTO.



PRODUCTS.

WOOSTER SAFE-GROOVE TREAD—STEEL, WHITE BRASS, BRASS.

Wooster Safe Groove Tread was designed by specialists who have been connected with the safety tread business for many years, the specific object being to overcome the various disadvantages voiced by users of safety tread. It is made up of alternate segmental grooves and dove-tailed recessed ribs, the recesses being filled with a non-slipping agent. The walls of the ribs supporting the non-slipping agent are so formed as to prevent the wearing away of the non-slipping agent any faster than the rib walls wear away, and as they are made of steel, hard brass, or white brass, the non-slipping agent stays in place until the tread is entirely worn out.

The non-slipping agent extends to the bottom of the dovetailed recess and to within 1-16th of an inch of the bottom of the tread. Thus Wooster Safe-Groove Tread is safe until worn clear through.

All widths of Wooster Safe-Groove Tread in Steel, Brass or White Brass are exactly uniform in design, being 1" from centre to centre of groove and 1" from centre to centre of rib. When a combination of two or more sections is used to make up an area, the edges fit snugly and the sections, all being uniform, give the area the appearance of one piece. All sections are the same thickness, and when different sections are combined, there is no variation of level on the upper surface. All sections of Wooster Safe-Groove Tread are furnished cut to any length as specified.

STANDARD WIDTHS OF WOOSTER SAFE-GROOVE TREAD.



3" WIDE WITH LIP NOSING.

This section is made in three materials. STEEL BASE filled either with carborundum or lead. BRASS BASE filled either with carborundum or lead. WHITE BRASS filled with lead only.



3" WIDE WITHOUT NOSING.

This section is made in three materials. STEEL BASE filled either with carborundum or lead. BRASS BASE filled either with carborundum or lead. WHITE BRASS filled with lead only.



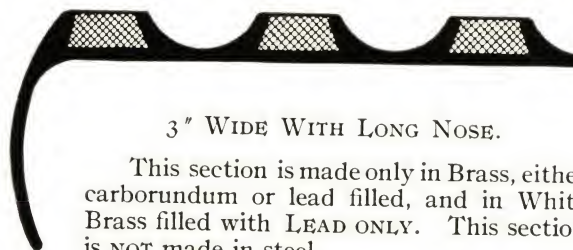
4" WIDE MADE WITHOUT NOSING.

This section is made in three materials. STEEL BASE filled either with carborundum or lead. BRASS BASE filled either with carborundum or lead. WHITE BRASS filled with lead only.



6" WIDE MADE WITHOUT NOSING.

This section is made in three materials. STEEL BASE filled either with carborundum or lead. BRASS BASE filled either with carborundum or lead. WHITE BRASS filled with lead only.



3" WIDE WITH LONG NOSE.

This section is made only in Brass, either carborundum or lead filled, and in White Brass filled with LEAD ONLY. This section is NOT made in steel.

ANCHORS.

When anchors are necessary, as in fastening the tread to new concrete, the tread comes with substantial anchors ATTACHED.

H. J. ST. CLAIR CO., LIMITED

Established 1909.

MANUFACTURERS AND BUILDERS OF COMPLETE STORE FRONTS.

OUR NEW FACTORY - - 28 EASTERN AVE.

TORONTO.

REPRESENTATIVES THROUGHOUT THE DOMINION.

HALIFAX,
Eagar-Coombs & Co.

CALGARY,
McDonald-Baker Co.

MONTREAL,
J. A. Gendron,
149 St. Elizabeth Street.

EDMONTON,
Edmonton Paint & Glass Co.

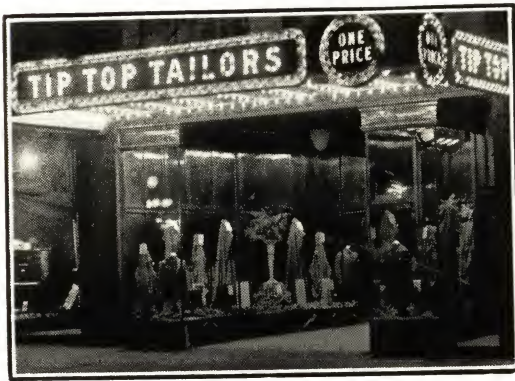
WINNIPEG,
Winnipeg Marble & Tile Co.,
199 Main Street.

REGINA,
Western Mfg. Co.

VANCOUVER & VICTORIA,
Wm. N. O'Neil Co. Ltd.

PRODUCTS.

DESIGNERS AND CRAFTSMEN; COMPLETE STORE FRONTS; COPPER, BRONZE; FINE WOODS; GLASS; TILE; MARBLE; SOLID BRONZE FRONTS; STEEL SHAPES; SIDE WALK PRISMS; EASYSET CONSTRUCTION; NU-METAL.



We are equipped to install up-to-date business-getting store fronts of any size. We are organized to carry out work in the most expeditious manner, as all material is assembled and finished in our own shop—shipped complete to the building, and erected by our own mechanics who are specialists in this particular line.



The artistic side of this business is competently handled—and Architects can rely on intelligent co-operation in working out any special scheme or treatment.



For the benefit of the Architectural profession and the Building trades we have a special service—which enables anyone interested to at once obtain suitable designs for any specific line of merchandising—or building—on sending us sizes of openings, etc. Catalogues and Detail sheets of metal sections gladly supplied.

A FEW OF OUR INSTALLATIONS.

(Note that these installations extend from the Atlantic to the Pacific.)

Navy League Bldg., Halifax, N.S.
Tip-Top Tailors, Halifax, N.S.
Lounsbury Bldg., Moncton, N.B.
Gallant & Crockett, Summerside, P.E.I.
Alec Drouin Bldg., Quebec, P. Que.
Almy's Dept. Store, Montreal, P. Que.
Mendelsohn Bros., Montreal, P. Que.
R. A. Lauzon, Montreal, Que.
Walk-Over Shoe Store, Toronto, Montreal and Quebec
Darwin's Limited, Ottawa, Ont.
Union Bank Bldg., Ottawa, Ont.
Stacey's Limited, Kingston, Ont.
Lockett's Shoe Store, Kingston, Ont.

Jury & Lovell Drug Store, Oshawa, Ont.
Page & Shaw's Candy Store, Toronto and Montreal.
Dunfield's Limited, Toronto.
Can. Gen. Elec. Bldg., Toronto.
McLaren's Jewellery Store, Hamilton, Ont.
Grafton & Co., Hamilton, Ont.
Thomas Furniture Store, London, Ont.
R. H. & J. Dowler, London, St. Thomas and Windsor
Sansburn-Pashley Jewellery Store, Windsor, Ont.
Confederation Life Bldg., Winnipeg, Man.
Allen Theatre, Winnipeg, Man.
Sherwood Bldg., Regina, Sask.
Hammond Bldg., Moose Jaw, Sask.

Robinson & MacBean, Ltd., Moose Jaw, Sask.
Cairn's Dept. Store, Saskatoon, Sask.
McMillan's Dept. Store, Saskatoon, Sask.
Caledonian's Dept. Store, Edmonton, Alta.
McLeod Bldg., Edmonton, Alta.
Hudson Bay Bldg., Calgary, Alta., Lethbridge Alta.
and Yorktown, Sask.
Oddfellows' Bldg., Calgary, Alta.
White's Hardware, Banff, Alta.
Scott's Bldg., Vancouver, B.C.
Sun Ban, Vancouver, B.C.
Central Block, Victoria, B.C.
Fitzpatrick O'Connell, Victoria, B.C.
Smith's, Prince Rupert, B.C.

ZOURI DRAWN METALS COMPANY

GENERAL OFFICES AND FACTORY:
CHICAGO HEIGHTS, ILL.

CANADIAN DISTRIBUTORS:

CONSOLIDATED PLATE GLASS CO. OF CANADA, LIMITED

241 SPADINA AVENUE, TORONTO, ONT.

WAREHOUSES AT

MONTREAL.

TORONTO.

WINNIPEG.

PRODUCT.

WAREHOUSE STOCKS.

SAFETY.

PATENTS.

CATALOGUE.

ZOURI SAFETY KEY-SET STORE FRONT CONSTRUCTION.

We would particularly draw the attention of Architects and Builders to the fact that The Consolidated Plate Glass Co. carry a full and complete stock of all our systems in their Toronto, Montreal and Winnipeg warehouses. We are, therefore, in a position to guarantee prompt deliveries.

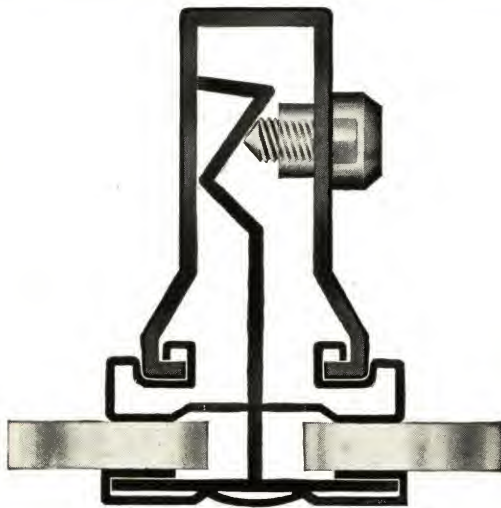
Preferential rating on plate glass is inevitable, as it is now in successful operation in every other line of insurance.

Flat rating is the arch enemy of safety. It encourages the cheapest substitutions that mechanical ingenuity can produce.

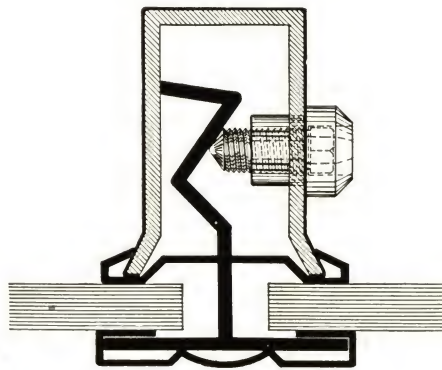
Zouri safety key-set sash, corner and division bars with self-adjusting setting blocks offer features of safety not found in any other line.

Operating under Murnane and Marr patents.
Other patents pending.

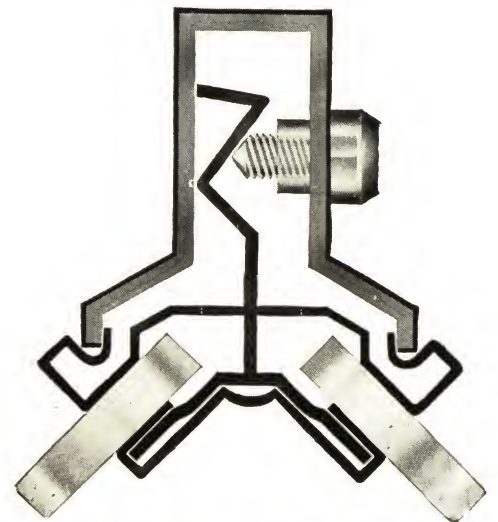
Catalogue free on application.



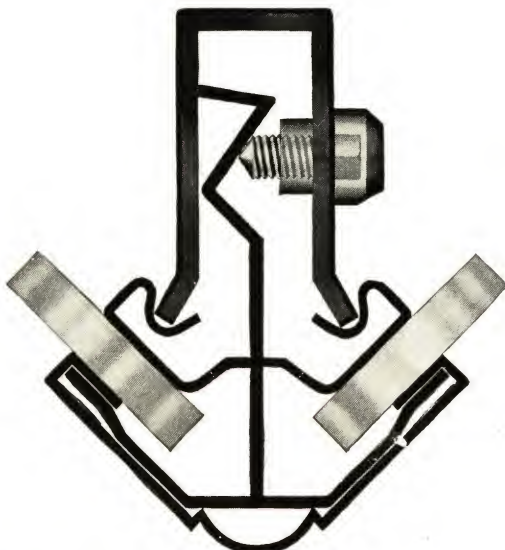
Full Size.
No. 301 SAFETY KEY-SET DIVISION BAR.
Weight 29 oz. per lin. ft.



No. 305 SAFETY KEY-SET DIVISION BAR.
For glass up to 78 in. high and not over 10 ft. long.



No. 201 SAFETY KEY-SET REVERSE CORNER BAR.
Made in angles from 85° to 145°, inclusive, for glass of largest size.

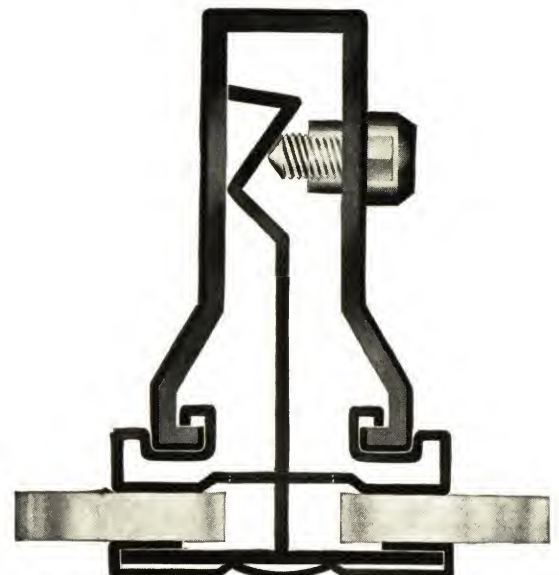


No. 200 SAFETY KEY-SET CORNER BAR.
Made in angles from 85° to 145°, inclusive, for glass of largest size.

Approved By
UNDERWRITERS'
LABORATORIES.
Zouri Safety Key-set
Lines are approved and
manufactured under su-
pervision of the Under-
writers' Laboratories.



FULL SIZE SOCKET
KEY FOR SETTING
ZOURI BARS.



No. 300 SAFETY KEY-SET DIVISION BAR.
For glass of largest size.

FULL SIZE DETAILS OF ZOURI CORNER AND DIVISION BARS.

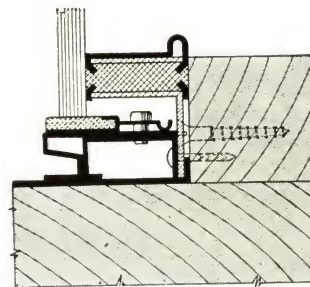


MURNANE SELF-ADJUSTING SETTING BLOCK.
Three-quarters actual size.



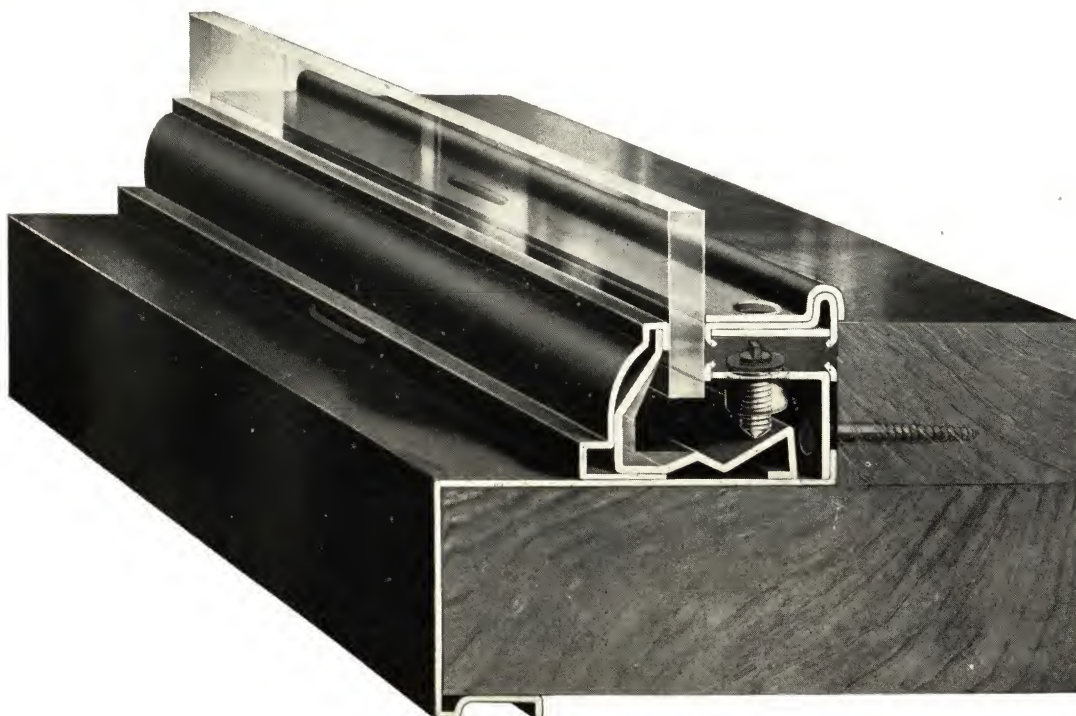
SHOWING THE NECESSITY FOR SELF-ADJUSTING SETTING BLOCKS.

Plate glass over 20 sq. ft. can not be safely set without self-adjusting setting blocks, the purpose of which is to insure that glass is brought into contact with the rabbet at points where it sets on blocks when outside moulding is applied. The cost of self-adjusting setting blocks is negligible considering the function they perform in the preservation of plate glass. Note the distorted position of glass above illustrated at points A and B, caused by glass not being in contact with rabbet at points where it sets on blocks. The weight and friction of plate glass on setting blocks is such that it will not slide, hence the necessity of self-adjusting setting blocks. Glass distorted in the slightest degree becomes an easy prey to wind pressure or vibration.



INNER MEMBER OF NO. 115 ZOURI
SAFETY KEY-SET SASH.

Illustrating the Murnane self-adjusting setting block in position before the outside moulding is applied.

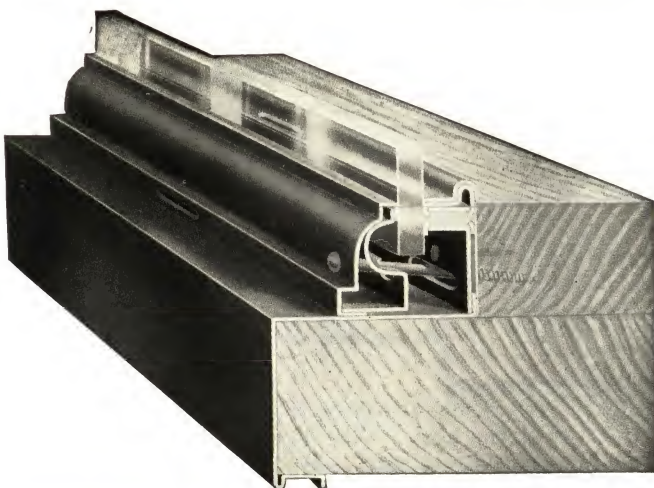


NO. 115 ZOURI SAFETY KEY-SET SASH WITH NO. 705 SILL COVERING.
Two-thirds actual size.

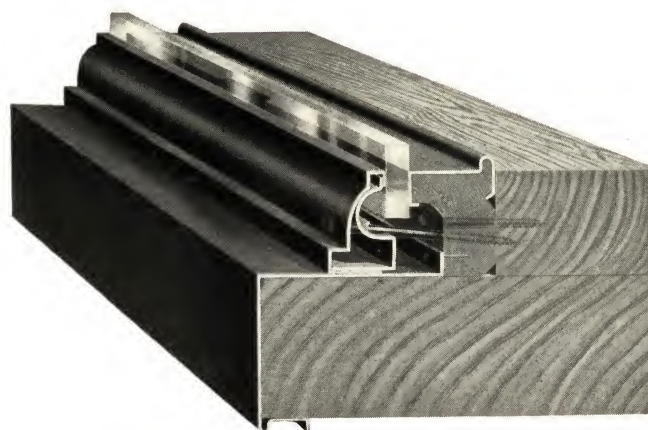
Approved By
UNDERWRITERS'
LABORATORIES.
Zouri Safety Key-set
Lines are approved and
manufactured under su-
pervision of the Under-
writers' Laboratories.



KEY FOR ZOURI SASH
No. 115.



NO. 160 INTERNATIONAL DIRECT SCREW PRESSURE SASH WITH NO. 708
SILL COVERING.
One-half actual size.



NO. 145 INTERNATIONAL DIRECT SCREW PRESSURE SASH WITH NO. 707
SILL COVERING.
One-half actual size.

DETROIT SHOW CASE COMPANY

MAKERS OF METAL STORE FRONT CONSTRUCTION,
DETROIT, MICH.

THE TORONTO PLATE GLASS
IMPORTING CO., LIMITED,
91 DON ROADWAY, TORONTO
DISTRIBUTORS

Desco
METAL
STORE FRONTS

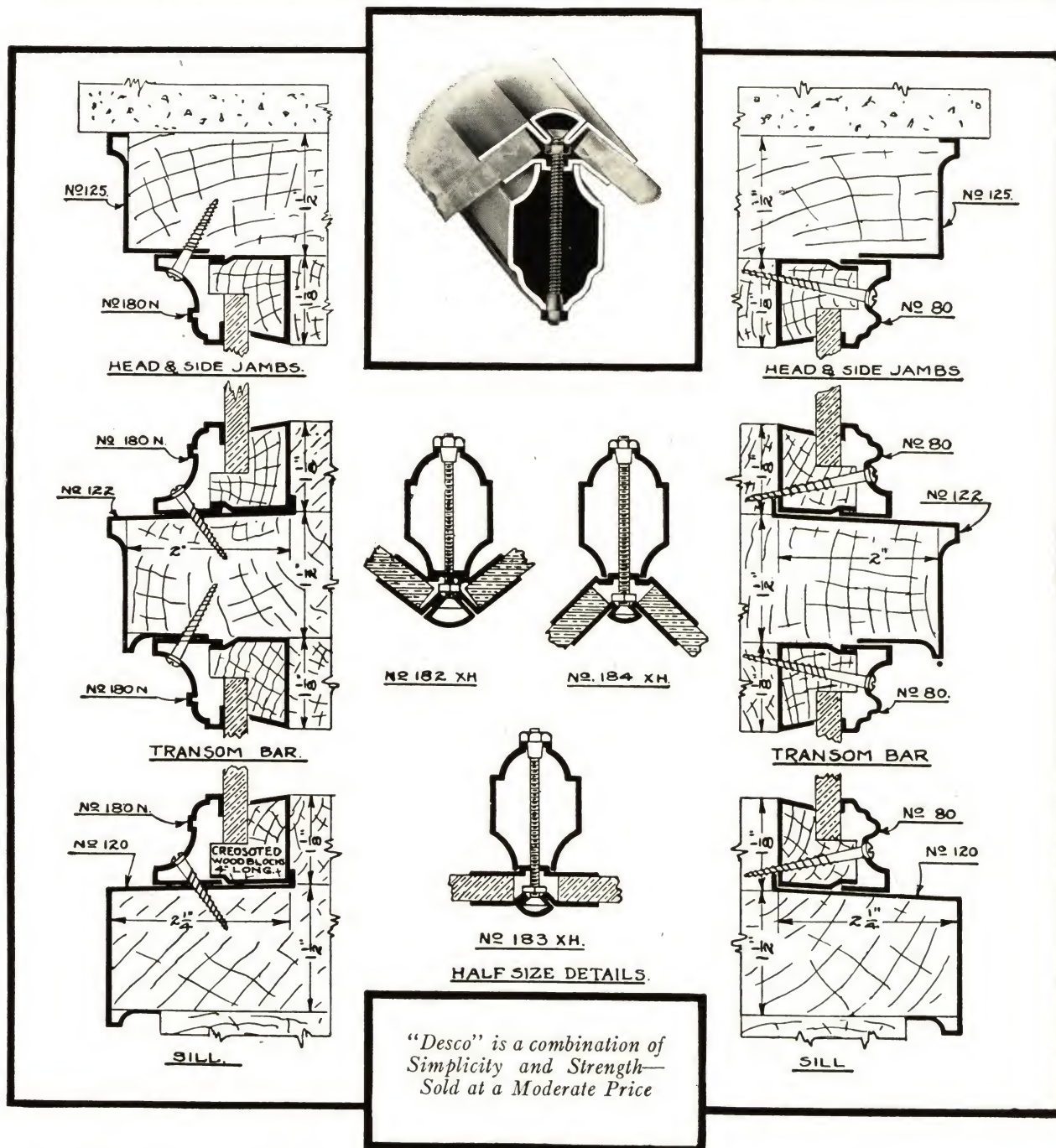
DESCRIPTION.

"DESCO" METAL STORE FRONT CONSTRUCTION. (PATENTED Oct. 29, 1918.)

"DESCO" store front construction is made and designed along the most approved architectural lines. The several shapes harmonize perfectly with the modern styles of store front construction. All glass bearing members are of solid, heavy gauge copper, reinforced at the back by steel channels, which have been treated by the universally used Parker Rust-Proof Process. This makes for greater strength, safety to the glass, and permanency.

"DESCO" LINE COMPLETE.—The "Desco" line of store front construction is complete in every detail, including ventilated sash, glass stops, division bars, corner bars, 3-way bars, reverse corner bars, sill coverings, transom bar coverings, bulkhead constructions, copper panel work, kick plates, thresholds, etc.

SIMPLICITY.—The simplicity of "Desco" store front construction is one of its strongest points. The ordinary mechanic without previous experience can properly and hastily install "Desco" construction.



CONSTRUCTION FEATURES.

VENTILATED SASH CONSTRUCTION.—The ventilated sash is made to hold the glass firmly in a deep rabbet and to take care of any expansion or contraction of the glass. The glass setting blocks are of creosoted cypress, about 6 ins. long, and are set well apart so as to give ample freedom to ventilation and drainage. Air has free access through the "Desco" sash and materially facilitates proper window ventilation. Particular emphasis is given to the simplicity of "Desco" sash.

CORNER AND DIVISION BARS.—All glass bearing members are of solid copper, reinforced by rust-proofed steel channels. Ease of installation is a particular feature of "Desco" construction.

SEND FOR COMPLETE ARCHITECTURAL DETAILS.

KING CONSTRUCTION CO., LIMITED

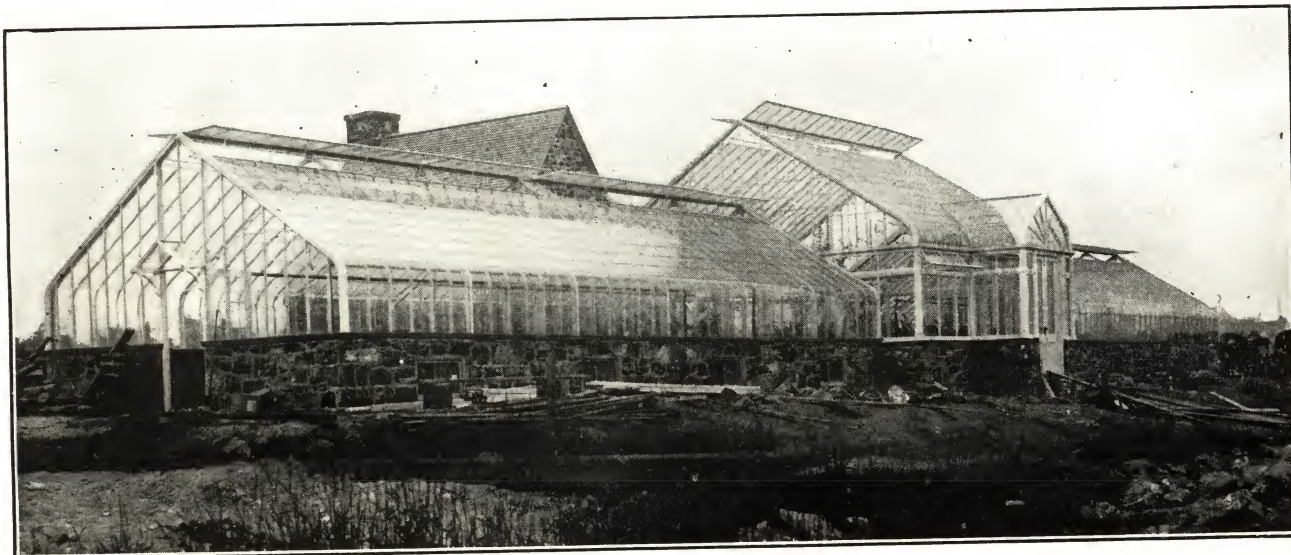
MANUFACTURERS OF GREENHOUSES AND CONSERVATORIES.

40 DOVERCOURT ROAD,
TORONTO, ONTARIO.

PRODUCTS.

CONSERVATORIES—ALL TYPES. IRON FRAME FLAT RAFTER, IRON FRAME PIPE RAFTER, SEMI-PIPE FRAME, TRUSSED FRAME.

SASH OPERATORS OF ALL TYPES—TORSION, TENSION, RACK AND PINION.



THIS RANGE OF CONSERVATORIES WAS ERECTED BY US FOR MR. J. E. DUBUC, CHICOUTIMI, QUE

CONSTRUCTION.

Our houses are designed to give the maximum of strength with the least amount of shade casting members. Flat iron rafters, one-half inch thick, are spaced every six lights apart. The rafters are connected by iron purlins of sufficient strength to carry the wood bars. In our curved eave type all wood bars are reinforced from sill to first purlin.

GUTTERS.

An important part in greenhouse designing is to arrange for the collection and disposal of the water of condensation within the greenhouse. We have provided for this by incorporating a condensation gutter in the design of our combination sill and gutter. This gutter also provides ample means to collect and dispose of the rain water from the roof.

MATERIALS.

All material used in the construction of our greenhouses are the best of their several kinds. The wood is air-dried, clear Gulf Cypress.

GLAZING.

All glass is supported by wood members. Each light is bedded in "Our Special Greenhouse Putty" or Permanite. Each light is laid with a lapped joint and firmly secured in place by means of our Special Zinc Glazing Points.

BENCHES.

The benches are constructed with Angle Iron Frames with cypress bottoms and sides. Plant tables have galvanized iron frames and cypress or planed slate bottoms.

VENTILATION.

Ventilating sash are placed on the roof and on the side when desired. They are formed into sections and each section is operated with our Easy Running Ventilating Apparatus from a convenient point.

HEATING.

We recommend hot water heating, as it is more economical and requires less attention than steam. The coils are placed under the growing benches or plant tables. The mains are run in heating trenches under the floor. This does away with the unsightly overhead pipes.

INFORMATION.

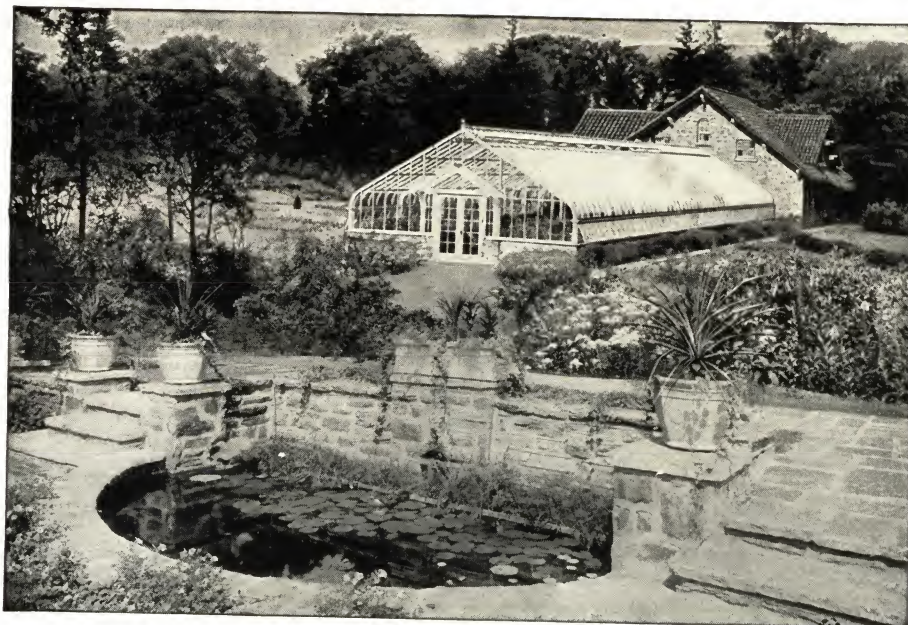
We have a complete catalogue, which will give you all the details. Write for a copy.

LORD & BURNHAM CO., LIMITED OF CANADA

MAIN SALES OFFICE:
HARBOR COMMISSION BLDG.
TORONTO.

DESIGNERS AND BUILDERS OF
GREENHOUSES, CONSERVATORIES,
VENTILATING APPARATUS, ETC.

FACTORY:
ST. CATHARINES, ONT.



Lord & Burnham Co. Limited of Canada

PRODUCT.

SECTIONAL CONSTRUCTION.

SECTIONAL IRON-FRAME GREENHOUSES AND CONSERVATORIES.

Sections are formed by setting up spans of rafters, 8 feet 4 inches apart, at either end of two lengths of cast-iron sills. The cross framing between these two spans of rafters consists of the gutters at the eaves and purlins between the eaves and ridge, upon which the cypress roof bars rest.

MATERIALS.

All iron and steel are of the highest grade; the wood used is clear Gulf cypress of best quality, thoroughly air-dried or British Columbia White Cedar.

GLAZING

All glass is bedded in putty and supported by wooden parts, which prevent breakage by expansion and contraction.

ERECTION.

This ideal greenhouse construction is so scientifically worked out that the labour of preparing materials and erecting is reduced to a minimum. It is not a house that has to be cut and fitted by hand, on the job. When the materials are delivered, it is merely a matter of bolting up the iron parts and fastening the screws. The expense of erecting is thus greatly reduced, practically equalizing the advance in cost of the iron-frame house over the wooden structure.

BEDS AND TABLES.

BEDS are made with galvanized iron frames, having cypress bottoms and sides; or galvanized iron frames with tile bottoms and cypress sides. Also all cypress.

TABLES are made same as beds excepting sides are lower.

BEDS are used when it is desired to grow plants directly in soil.

TABLES are used for potted plants.

VENTILATION.

Ventilation sash are located at ridge and where required on the sides. They are in continuous runs and are opened and closed by our patented Ventilating Machinery, with hand wheel placed in convenient location.

HEATING

Coils of 3½-inch (I.D.) cast-iron pipes or 2-inch steel made up with caulked joints are generally located under the benches, where they do not take up any growing space, and are so arranged as to secure a free circulation of air around them. Their surfaces are so distributed as to give the desired temperature, with sufficient control in each compartment to produce the best growing conditions.

Burnham Boilers are used, with ample mains for carrying water to the coils.

The system is installed with sufficient grade to insure rapid circulation and even distribution. The coils are equipped with automatic air headers to prevent all air locks.

We have a very complete Catalogue, to which you are most welcome.

See also our advertisement on opposite page



LORD & BURNHAM CO., LIMITED OF CANADA

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GREENHOUSES, CONSERVATORIES,
VENTILATING APPARATUS, ETC.

FACTORY:
ST. CATHARINES, ONT.

PRODUCTS.

CONTINUOUS SASH OPERATING APPARATUS in various styles and sizes for Operating Hinged and Pivoted Sash in Factories, Foundries, Car Barns, Roundhouses, Power Houses, Machine Shops, Steamers, Banks, Churches, Prisons, Greenhouses, etc.; TRANSOM OPERATORS for heavy Transoms in such places as Store Fronts, Hotels, Public Buildings, etc.

SASH OPERATING APPARATUS.

We make three distinct types of apparatus. There is hardly a sash operating requirement that cannot be met satisfactorily by one of them. In cases, however, where unusual conditions make it desirable, we will make such modifications in our standard type as are necessary to meet requirements in the most efficient manner.

ROCKER SHAFT APPARATUS.

For short and medium length runs. Arms are attached to shaft that act directly on sash, through suitable rods. Self-locking at any point. No complicated mechanisms. Easy to erect and simple and easy to operate.

RACK AND PINION APPARATUS.

Particularly adapted to long runs of heavy hinged sash. The direct horizontal thrust given to sash, by racks running over the shoulders of the pinions, minimizes the leverage which reduces the torsion. Its simplicity is a strong point in its favor

SCREW THREAD APPARATUS.

For transoms and windows where especially neat and compact fixtures are desired.

TENSION LEVER APPARATUS.

For runs too long or too heavy for practical operation with either our Rocker Shaft or Rack and Pinion type. Special circular on request

ESTIMATES AND CO-OPERATIVE SERVICE.

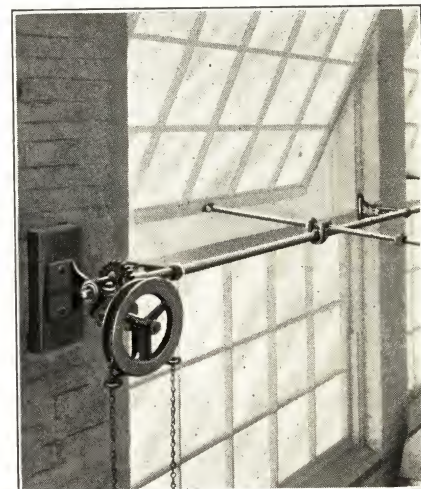
On receipt of data giving description of sash and surrounding construction, the designing department will gladly submit sketches, suggestions and estimates for furnishing either standard or specially designed apparatus to exactly meet individual conditions; also estimates for erecting the apparatus.

CATALOGUE.

Our Catalogue illustrates and describes more fully our types of sash operating apparatus. It will be sent on request.



Continuous runs of windows throughout the Toronto Civic Arena are equipped with our ROCKER SHAFT SASH OPERATORS



RACK AND PINION APPARATUS.
For short and medium length runs.

See also our advertisement on Greenhouses on opposite page.

CANADIAN CINCH ANCHORING SYSTEMS, LIMITED

MONTREAL, P.Q.:
IRVING SMITH,
NEW BIRKS BUILDING

250 RICHMOND STREET W.,
TORONTO, ONT.

WINNIPEG, MAN.:
GEO. OXTON,
336 COLONY STREET

PRODUCT.

CINCH ANCHORING SPECIALTIES:

CINCH EXPANSION BOLT, CINCH ANCHOR AND CINCH STUD ANCHOR.

PRINCIPLE.

The principle employed in constructing the Cinch anchoring specialties is scientifically sound. It is based on the wedge, the screw and the lever.

A cinch anchorage bites quickly and positively. Properly installed, it cannot pull out or work loose. Its lead-composition parts get a complete surface grip, filling even the shallowest irregularities in the wall of a hole. As the pull increases, the push against the side of the hole increases more than proportionately on account of the wedging action of the iron cones. The greater the load sustained the stronger the hold obtained.

A Cinch anchorage can be used on any machine bolt or machine-threaded attachment device. It consists of two or more lead-and-iron expansion units, as explained below. An anchorage of less than two expansion units is never used. A two-unit anchorage is sufficient to carry ordinary loads. The smallest Cinch anchorage, 3/16 of an inch, has carried a weight of over one thousand pounds in numerous tests.

Typical Example of Installation

Cinch Expansion Unit

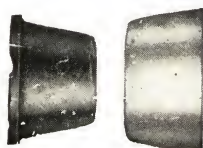


Fig. 1

One Cinch expansion unit is shown in Figure 1. It consists of two parts: (a) a conical wedge male part, either plain or threaded, made of malleable iron; (b) a lead-composition female part.



Fig. 2

Insert bolt with first unit in hole. (A Cinch anchor is being used here. If a Cinch stud anchor were being used, the first unit would be threaded and a stud bolt would be used instead of a standard machine bolt.

Cinch Expansion Bolt



Fig. 3

A two-unit Cinch expansion bolt consists of a two-unit, threaded, Cinch anchorage, reversed, fitted on a standard machine bolt. Figure 3 shows a two-unit Cinch expansion bolt, before expansion. The iron at the left is threaded. The other iron is plain without thread.

Cinch Anchor



Fig. 4

A two-unit Cinch anchor consists of a two-unit, plain, Cinch anchorage fitted on a standard machine bolt with nut. Figure 4 shows a two-unit Cinch anchor, before expansion.

Cinch Stud Anchor

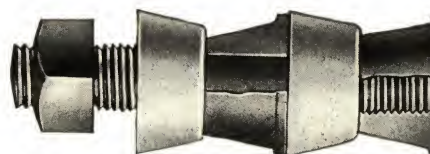


Fig. 5

A two-unit Cinch stud anchor consists of a two-unit, threaded, Cinch anchorage, fitted on a stud bolt with nut. Figure 5 shows a two-unit Cinch anchor, before expansion. Note that the order of the parts is the same as in the case of the Cinch anchor—iron, lead, iron, lead.

ALL THREE CINCH ANCHORING SPECIALTIES, the Cinch expansion bolt, the Cinch anchor and the Cinch stud anchor, are a combination of the Cinch anchorages and either a standard machine bolt or a stud bolt. The two-unit anchorage only is illustrated here. Additional expansion units, not threaded, may be added whenever more than ordinary strength is required.

POINTS OF SUPERIORITY.

1. The Cinch Anchoring System is 100% efficient.
2. *Stronger than the Strongest Bolt.* Cinch anchoring specialties give the only anchorage guaranteed to hold beyond the tensile and shearing strength of any wrought iron steel bolt, as well as the breaking strength of the nut. They will not crush or otherwise mar the face of masonry. Vibration will not loosen the grip of the anchorage.
3. *Cut Drilling Costs.* Cinch anchoring specialties require a hole of less depth than any other expansion device, affording a great saving of labour and time in drilling, and a substantial saving of material because of the shorter length of bolt needed.
4. *Easy to Install in Any Position.* Cinch anchoring specialties are easy to install in any position. They can be set in masonry with the head of the bolt out of or in the hole. When the latter method is followed, expansion can be completed before work is lifted into place and bolted fast.

N. SLATER COMPANY, LIMITED

HAMILTON, ONTARIO.

TRADE MARK



REGISTERED.

DEPARTMENTS:

ALLIETH MANUFACTURING CO. LIMITED
FIRE DOORS AND SLIDING DOORS IN DETAIL.

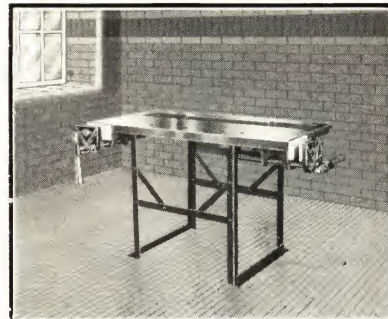
ACME STAMPING AND TOOL WORKS
POLE LINE HARDWARE AND STAMPINGS.

PRODUCTS.

CONSTRUCTION HARDWARE, FIRE DOORS, TRACKS AND HANGERS IN STOCK AND TO ORDER; ELECTRICAL POLE LINE HARDWARE; STAMPINGS—ALL MANNER OF STAMPINGS TO THE TRADE.



"RELIABLE" ROUND TRACK WAREHOUSE HANGERS.



TECHNICAL SCHOOL BENCHES.

Square track, round track and flat track fixtures (gravity and level action), single or multiple, in any standard number.

Flexibility and adaptability guaranteed.

Parallel, folding or swinging types of doors required.

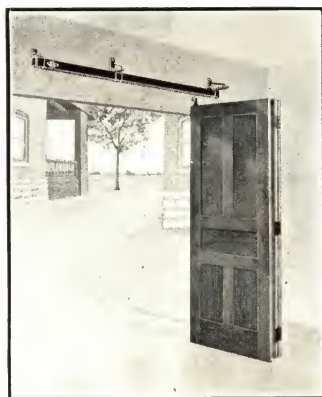


GRAVITY FIRE DOOR SINGLE TYPE.

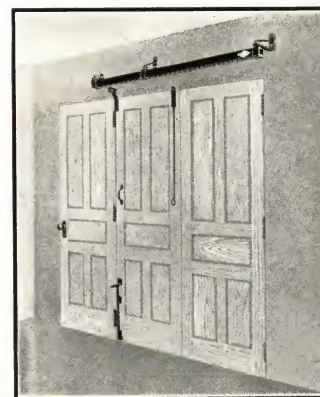
Our fire door fixtures are regularly inspected and labeled by the Underwriters' Laboratories, Incorporated.

Other construction hardware lines: Sliding Door Hangers, Parlor Door Hangers, complete lines.

Special designs require blue prints.



SQUARE TRACK, MULTIPLE TYPE OPEN.



SQUARE TRACK, MULTIPLE TYPE CLOSED.

FIRE DOOR FIXTURE DATA. SPECIFICATION REQUIREMENTS.

- 1st. Style of door you propose to erect, advise whether single or double, also whether sliding or swinging. If you follow the directions and order by number this will easily be carried out. In asking for quotations, always specify by number of doors, also whether they are to be used on one side or both sides of openings. All fire doors must lap over the 4"—so in specifying do not get the size of the door mixed up with the size of the opening.
- 2nd. Always specify width and height of opening (width first).
- 3rd. Thickness of door, whether 2-ply 1 3/4" or 3-ply 2 3/8".
- 4th. Thickness of wall, if wall bolts are required.
- 5th. Specify whether door is arched or square.
- 6th. Always specify what overhead room you have above the opening.

7th. Do not forget, if the Standard Fixtures are not suitable for your work, and you have not the required wall space, we must have a drawing of the opening and all details, so that the Fixtures will be made up to suit the job.

8th. Always specify whether you require Labeled or Unlabeled Fixtures.

NOTE.—If Fixtures are ordered, they will be shipped as our Standard Fixtures unless otherwise advised.

NOTE.—Do not use Standard prices for special jobs. Special Fixture prices quoted on request, accompanied by drawing of same.

9th. Swinging Door Fixtures, always specify whether they are for flush or overlap, and thickness of doors

MINOR
PRODUCTS.
CATALOGUES.

Strap and Spring Hinges, Hasps, Chest Handles, Door Rings, Barn Door Fittings, Door Latches Store and Shelf Ladders and Merchandise Carriers.

Catalogues complete on request.

RAWLPLUGS

INVENTIONS, LIMITED

SOLE AGENTS FOR
THE RAWLPLUG CO. OF CANADA.
128 BLEURY STREET, MONTREAL, QUE.

RAWLPLUGS

PRODUCTS.

A Rawlplug is a device which enables a screw to hold in any material.

DESCRIPTION.

The Rawlplug is a hollow tube of stiffened longitudinal strands of fibre, so cemented that when once in position it is impervious to decay and is unaffected by moisture or change of temperature. The hole required is smaller than the head of the screw, and therefore the Rawlplug is invisible when the screw is in place. As the screw is turned home the fibre strands expand and enter the interstices and minute pores of the hole, resulting in a strong and lasting grip. The screw cuts a permanent thread in the Rawlplug, which permits withdrawing and reinserting the screw at any time in the orthodox manner.

Rawlplugs are made in various lengths for use with all sizes of screws from No. 3 to No. 26.

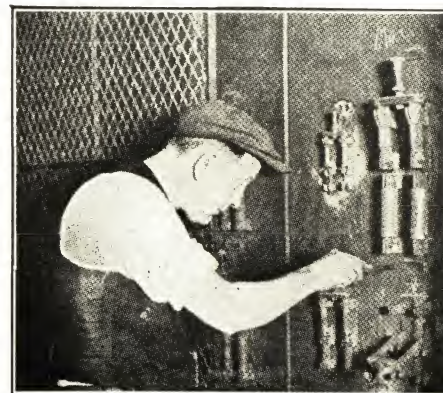
HOLDING POWER OF RAWLPLUGS.

The unusual holding power of the Rawlplug is due to the following facts:—

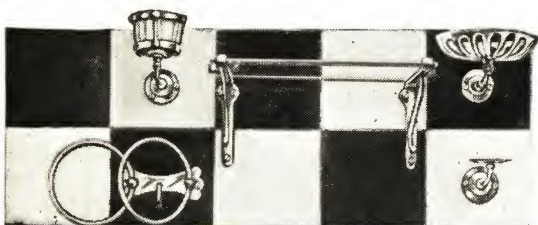
1. Friction is developed continuously and uniformly between the entire surface of the plug and the sides of the hole in which it is inserted.
2. There is no tendency to fracture the adjacent material, as the grip is obtained by uniform pressure rather than by forcing lugs or corrugations into the material. Hence the material surrounding the plug is never weakened.
3. Rawlplugs resist and absorb vibrations and shocks due to the unusual composition of the plug. There is never the tendency, therefore, to work loose from these causes, as in the case of metal fixing devices which cut the surrounding material and eventually loosen.
4. The pressure exerted upon insertion of the screw forces the minute fibres into all the pores and interstices of the surrounding material, the Rawlplug thereby becoming an integral part of the material.



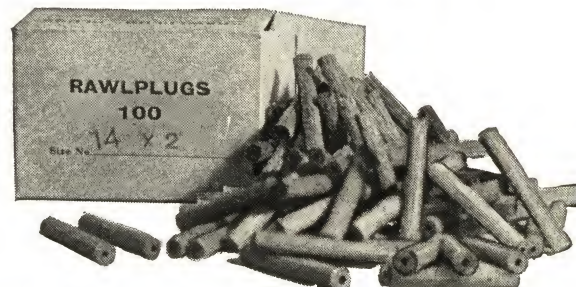
For Fastening Metal Moulding.



For Switchboard Work.



The heaviest fixtures can be made to hold firmly, neatly and permanently in glazed tiles or marble with Rawlplugs.



Rawlplug Tool.

ILLUSTRATIONS.

SCOPE OF USE.

The above illustrations give an idea of some of the uses to which Rawlplugs can be put.

Because of their composition and construction, Rawlplugs are used successfully in every kind of material, including brick, plaster, concrete, stone, cement, tile, stucco, marble, slate, plate glass, hollow tile, hard rubber, composition wall boards, metals, etc.

Where anything is to be fastened to any material, it can be accomplished positively and permanently by means of Rawlplugs and ordinary screws. They will withstand vibration indefinitely and have been used extensively where this factor has caused trouble before.

ECONOMY.

The initial cost of Rawlplugs is very small. They save money on account of their very low cost and the fact that skilled labor in handling is quite unnecessary. Only the minimum amount of time is required for their installation, and owing to their extraordinary holding power smaller screws than heretofore may be used, and consequently less drilling is necessary.

THE CANADIAN LAUNDRY MACHINERY CO., LIMITED

47-79 STERLING ROAD,
TORONTO, ONT.

PRODUCTS.

A complete line of LAUNDRY MACHINERY of every description.

Complete LAUNDRY PLANTS for hospitals, hotels, institutions and private residences, as well as for the commercial laundry; STERILIZING and WASHING MACHINES, of various sizes, for handling contaminated and infected linen; FLAT WORK IRONERS; DISINFECTING PLANTS for hospitals and institutions; TAHARA AUTOMATIC SILVER BURNISHING MACHINES for burnishing silverware, and a complete line of Machinery for CLEANERS and DYERS.

SERVICE.

Our Engineering Department will furnish, promptly, complete plans, specifications and estimates. Catalogue, or a complete set of specifications covering all "Canadian" Laundry Machinery, will be sent to any Architect on request.

FACILITIES.

Our experience in manufacturing laundry equipment extends over a period of more than thirty years and we have every facility for turning out high grade work, including the smaller as well as the larger equipment for the modern and efficient laundry.



6-ROLL FLAT WORK IRONER.

The famous Hagen line, made in all convenient sizes, from 1-roll to 8-roll; equipped with all "Canadian" features, such as ribbon feed, automatic finger guard, power pressure device, pressure indicator, etc. Made in 100-in., 110-in. and 120-in. lengths; also manufacture cylinder type Flat Work Ironers.

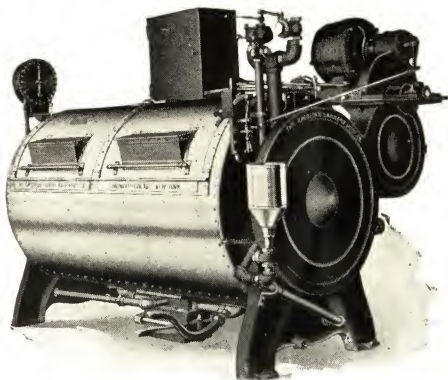


TRADE-MARK.



TAHARA SILVER BURNISHING MACHINE.

For Hotels, Clubs, Restaurants, Hospitals, etc. Built in a number of sizes and combinations. Restores silver to its original lustre and finish with no injurious effects to the silverware.



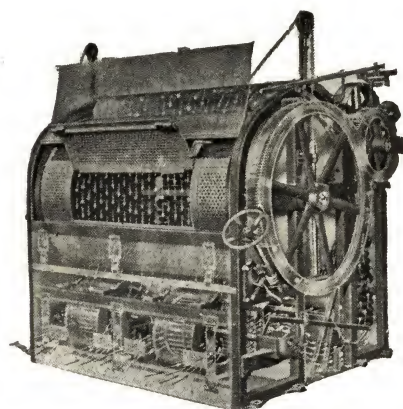
CASCADE WASHER.

Made with brass cylinder, of either brass or galvanized iron outer case; cylinder 36 or 42 ins. in diameter, and either 64, 72 or 84 ins. in length; has capacity of 4 ordinary washers and particularly adapted for use in hotels and institutions.



EXTRACTOR WITH AUTOMATIC SAFETY COVER.

Inner basket revolving rapidly removes moisture by centrifugal force. Smooth running. Highly efficient. Made both underdriven and overdriven, with either belt or motor drive. Diameter 20 to 48 ins.



CANADIAN VENTO DRYING TUMBLER.

Case made of galvanized iron, cylinder of either brass or heavy galvanized iron wire; cylinder 40 ins. in diameter and either 44, 54, 64 or 94 ins. in length; either belt driven, reverse or non-reversing type; single or double motor drive or panel controlled. One feature of the machine is that it uses practically 80% of the heated air over again.

REFERENCES.

The booklet "References," giving a list of hundreds of "Canadian" laundry installations, will be sent on request.

GENERAL.

We cannot illustrate all our machinery in the space at our disposal in this publication, but are always anxious to do our very best for each customer, and urge you to give our Engineering Department details of your requirements.

Architects should always provide in their plans for a six-foot door into laundry room.

THE McCLARY MANUFACTURING COMPANY

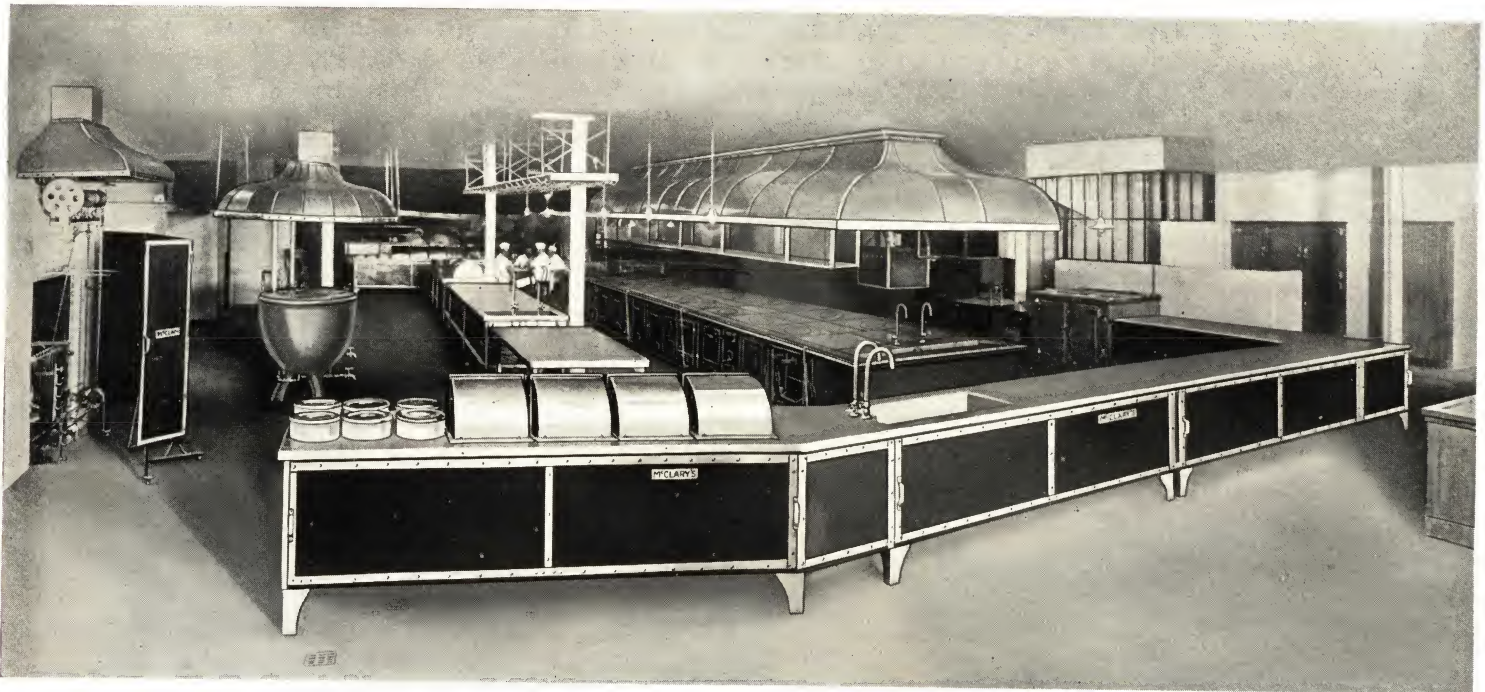
HEAD OFFICES AND FACTORIES AT LONDON, ONT.

Distributing Warehouses at LONDON, ONT., TORONTO, ONT., MONTREAL, QUE., WINNIPEG, MAN., VANCOUVER, B.C.,
ST. JOHN, N.B., HAMILTON, ONT., CALGARY, ALTA., SASKATOON, SASK., EDMONTON, ALTA.

HOTEL AND INSTITUTIONAL
KITCHEN EQUIPMENT

McClary's

EVERYTHING FOR
THE KITCHEN



HOTEL AND INSTITUTIONAL KITCHEN EQUIP- MENT.

The establishment of our Hotel Kitchen Equipment now dates back many years. Its initial success in providing modern equipment has been quickly followed up by a close observance to the rapid increase in labor-saving devices and the immediate supply of these to progressive Hotels and Institutions.

The immense facilities at our disposal for the development of articles for Kitchen use has enabled us to bring to our Hotel Kitchen Department resources capable of more than ordinary development along the right lines. The designing and manufacture of our specialized equipment demands trained artisans and exceedingly capable management; we are fortunate because of our seventy-five years manufacturing experience to be in a position to furnish men whose profound knowledge and enthusiasm has enabled them to bring to this Department a remarkable insight into the requirements of the Canadian Trade.

During the past few years, we have supplied numerous Hotels, Cafeteria and Hospitals with practically their entire Kitchen Equipment. No matter how large the requirements may be, we are in the happy position of possessing means which are equal to any demand. At the same time, we are always pleased to supply the more modest requirements with equal promptitude and efficiency.

The illustration above depicts the interior of the Canadian Pacific Railway Hotel Kitchen at Vancouver. This fine equipment was supplied by us, and demanded exceptional manufacturing experience to meet the varied types of equipment as called for in a complete hotel kitchen.

It is our privilege to offer you a service that you will find complete in every respect. We are prepared to assist you in laying out a Kitchen and furnishing technical data that may be of material assistance to you. Plans and specifications are part of our service and experts are always ready to answer enquiries and add their specialized knowledge to yours in the preparation of quotations.

"CHEF" HOTEL RANGE.

Built of highest grade materials, all of which undergo rigid tests before used. Built to any requirements from one Oven, one Firebox and up.

Body of 10 gauge steel, rivetted, bolted and lined with pure firebrick. Ends and back of Range braced with heavy angle iron.

Top of heavy cast iron, burnished to a smooth even surface. Outside frame $\frac{3}{4}$ " thick with heavy flanges to support French plates, which are $1\frac{3}{8}$ " thick.

Oven walls of heavy steel plate, with sides and top of one piece—steel plate bottom strengthened with cast iron stiffeners. Top of Oven covered with Asbestos and protected with cast iron grating.

Oven door of heavy gauge steel plate with $1\frac{1}{2}$ " x $\frac{1}{4}$ " polished wrought iron frames with reinforced corners. Door supports of $\frac{5}{8}$ " wrought iron bars.

Firebox linings of firebrick—lined in front with 6" firebrick, other three sides 4" firebrick; Ashpit bottom with 1"; Flue bottoms of Oven with 1"; back of Oven 6" solid firebrick and front over top of Oven with 3" firebrick. All bricks of standard size and can be replaced locally.

Heavy semicircular Grates readily cut out clinkers and ashes by gently rocking shaker to and fro. Entire contents of firebox may be dumped into ashpan by turning Grates completely over. Grates easily removed by loosening four nuts.

Sectional ring cover over fire permits pots of any size to come into direct contact with the fire.

Smoke pipe may be attached to top or at back—under certain conditions down draft may be arranged for.

Control and heating handled from front of Range by dampers for each oven and direct damper when lighting fire.

With sheet flue construction, each Oven can be handled and heated separately, so that the temperature of each Oven can be regulated independently.

Hot blast for soft coal.



HOTEL AND INSTITUTIONAL
KITCHEN EQUIPMENT

McClary's

"GARLAND" HOTEL RANGES
CONSTRUCTED WITH ANY NUMBER OF BURNERS AND OVENS
AS REQUIRED"GARLAND"
HOTEL RANGE

In Hotels, Restaurants, Cafeterias, large or small, this Range has met with tremendous success. It is adaptable to the chef's every requirement, affording the capacity from a single range to a battery of any desired length, sections being so constructed that they may be added without any structural alterations.

The All-Hot Solid Top, heated by nine single-jet Bunsen Burners, forming practically a solid sheet of spreading flame underneath the top will maintain a cooking heat on the ENTIRE FRONT of 1,250 degrees, graduating to 600 degrees at the back—quicker and hotter than anything else available.

Either side of this top can be operated independently of the other by the manipulation of a single valve, thus affording any required temperature and a great economy in fuel. When the heavy work has been completed, and the gas under both sections turned off, prepared articles can be kept at a serving temperature by the use of the centre or "Simmer" burner alone.

CONSTRUCTION—Body and Front of heavy steel.

TOP—has four sections—solid polished cast iron pantops—each equipped with Boston Ring Cover. Maximum temperature attainable, 1,250 to 600 degrees from front to back of range—producing all-hot, solid top.

TOP BURNERS—Nine single jet Bunsen Burners to each section, forming a solid sheet of spreading flame underneath the cooking top. Burner box lining of 2 1/4" firebrick.

STEEL OVEN BOTTOM—Entirely new construction—ventilated instead of insulated. (Patented). Quickens oven action 25 per cent. Insures even and economical baking. Removable without unfastening any bolts.

OVEN BURNERS—Three regular tubular burners of the "Garland" Type and efficiency for each oven. Easily removable, through front openings, without tools. Controlled by individual cocks in addition to side lever.

PANCAKE GRIDDLE.—To fit into space of right or left section of top can be furnished. Width 12 1/2 inches.

OVEN DOORS—Of extra heavy iron and steel, substantially braced and counterbalanced.

Can be fitted with Salamander Broiler.

Top Surface	68 1/2 x 38 inches
Height from floor to cooking top	33 1/2 "
To Top of High Shelf	62 "
Ovens	26 x 26 x 26 "

LIST OF HOTELS EQUIPPED WITH "GARLAND" RANGE

Biger Hotel, Montreal:
Walker House, Toronto:
King Edward Hotel, Toronto:

G.T.R. Restaurant, Montreal:
Commercial Dining Room, Montreal:
Cafeterias, Limited, Toronto:
and hundreds of other satisfied users.

National Club, Montreal:

HEAVY DUTY
ELECTRIC
RANGE.

A complete equipment for Electric Baking and Cooking. Ovens are of standard size, cooking surface can be supplied any length desired—the equipment can therefore be constructed to fit any given space, or as large as required to meet the necessary demands. Ovens can also be furnished either singly or in batteries of two up to any number with or without cooking surface.

Frame of Sheet Steel, japanned bright black, and blue-black enameled cooking surface.

OVENS—Seamless, round cornered, porcelain enameled, washable oven, as easily cleaned as any other enameled cooking utensil; operates like a fireless cooker, practically air-tight construction, holding the generated heat within.

PROTECTED ELEMENTS—A porcelain disc encircling the wire coils, made by special process and the finished result of four years' investigation and experiment. The most successful feature of present-day Ranges. Removes worry, expense and delay caused by short circuiting, burning out and other damage when the ordinary exposed cleanout is touched with a fork or kettle or when syrups or grease boil over on it.

Oven Elements 2,500 watts; surface elements 1,400 and 850 watt s. Current demand calculated on basis of Oven Element 22 amps. Large surface element 12 amps.; small surface element 8 amps.

All wires and connections easily accessible—Range connection neatly enclosed in metal box.

ELECTRICALLY
EQUIPPED
SERVICE TABLE.

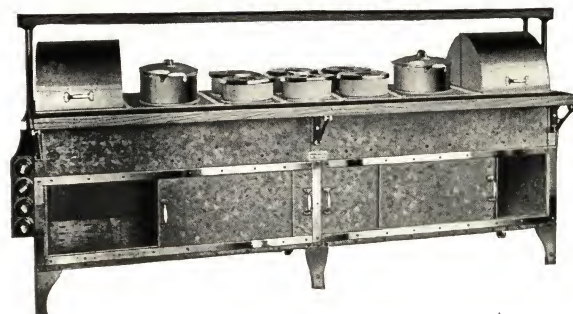
In conformity with all classes of large Kitchen equipment, our Carving and Serving Tables can be supplied in a variety of sizes to meet all the many different requirements.

STANDARD SPECIFICATION—All Panels made of cast-iron, nickel-plated; Meat panel with tin roll up cover; Vegetable panels with two 8-quart china crocks and copper nickel-plated covers; Gravy Panels with two 2-quart copper nickel-plated gravy boats and covers; Soup Panel with 3 gallon copper, nickel-plated tureen with cover. (If Fish Panel required, must be specified, and with one or two pans).

Plate Warmer Base of galvanized iron—has sliding doors one side, one shelf in bottom of warmer, one carving board on same side as sliding doors. If warmer not required, specify "Skeleton Construction."

Main top is built up in sections. These sections fit closely into each other and lie snug to the sides and end of the body. They are constructed of cast-iron heavily nickel-plated, or, if desired, white enameled.

Main body of best quality heavy gauge galvanized iron (standard), or, if preferred, blue polished steel; held firm and rigid with heavy angle frame and strong cast iron legs, galvanized. 9 inches high, screwed firmly on to bottom of body. Legs filled in with cast-iron block, avoiding dust collecting in the angles, Sliding doors on one or both sides, as desired. Doors run on separate nickel-plated bar iron tracks. Can be equipped with centre shelf. Shelves perforated and removable for cleaning. Handles of doors polished aluminum.



THE GALT STOVE & FURNACE CO., LIMITED

SPECIAL REPRESENTATIVES
 TORONTO.....MESSRS. DRUMMOND & REEVES.
 MONTREAL....THE J. H. HANSON CO. LTD.
 QUEBEC.....MESSRS. PRUNEAU & CIE.
 HALIFAX.....MESSRS. EAGER COOMBS & CO.

MANUFACTURERS OF
 THE "BANNER" PIPELESS FURNACE.
 GALT, ONTARIO, CANADA.

SPECIAL REPRESENTATIVES
 WINNIPEG....THE WINNIPEG PAINT & GLASS CO. LTD.
 CALGARY....MESSRS. GORMANS LIMITED
 EDMONTON...MESSRS. GORMANS LIMITED
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THE OLD WAY.



GRAVITY LOCK.



THE MODERN WAY.

MAJESTIC COAL CHUTES.

- (1) PROTECT AGAINST DAMAGE.
- (2) ENHANCE PROPERTY VALUE.
- (3) LESSEN DEPRECIATION.
- (4) SAVE MONEY.

The value of the Majestic Coal Chute can only be estimated when it is remembered that every delivery of coal by careless drivers can occasion enough damage to necessitate repairs. With the present high cost of labour and materials, it takes but a few repair bills to more than equal the cost of a Majestic Coal Chute.

No one likes crawling through a dirty coal bin to unlock or lock a cellar window. With a Majestic Coal Chute there's no need to. The Majestic is unlocked from the inside—without going into the bin. It is locked by the coalman from the outside when he closes the hopper of the chute.

When closed, the Majestic Coal Chute locks automatically and sets flush with the walls of the building. When open, the door of the chute protects the building above the hopper right where the damage is usually done. When the hopper is open the coalman has a large coal hole to receive the coal.

Majestic Coal Chutes are absolutely fireproof and burglarproof. Their various styles and sizes make them adaptable to any coal room window. Several hundred thousand are now in use in the United States and Canada, having been specified by the leading architects of both countries.

NUMBERS 10-A AND 20-A.

Styles 10-A and 20-A are more than coal chutes—they are windows as well.

The doors are fitted with $\frac{1}{4}$ inch wire glass, secured by adjustable wire clips, making it possible to change over to a steel front chute at any time.

When closed, the chute hopper and protecting shield lies flat on the bottom of the chute, allowing the daylight to shine into the coal bin, lighting the basement.

When open, the steel protecting shield lies over the glass, giving it ample protection from being broken. The door automatically locks open and when the hopper is pulled out is ready to receive coal.

In homes where a well-lighted basement is desirable, these chutes are ideal.

NUMBERS 10-B AND 20-B.

Style B is the same as Style A with a steel panel replacing the glass front. For this panel the Style A protecting shield is used. This makes the Style B chute interchangeable with Style A by merely adding the $\frac{1}{4}$ inch wire glass. Style C is the same as Style A only has no hopper. Style D is the same as Style B without a hopper.

MAJESTIC GRADE LINE CHUTES.

Where a building has no foundation above ground, or has a very low one, the Grade Line Chute is used. It can also be used in store buildings where the floor level is flush with the sidewalk. The door and frame are made of heavy cast semi-steel, they can even be driven over by a wagon without damage. The hopper sides are boiler plate, the body is made of steel plate and angle iron. Can be unlocked only from the inside.

MAJESTIC DOME DAMPER.

The Majestic Dome Damper can be operated from the *end* or from the *front*. When the damper is operated from the front, the long arm called "operate front" is used. When the damper is operated from the end, the long arm called the "operate end" is used. In regulating the damper from the end, one can insert the short arm in the long arm either to the right or left of left side of long arm.

There are no bolts or screws in the Majestic Dome Damper to get out of place or to become lost. Operated by the knuckle joint, the working parts are easily adjusted, and the damper can be opened and locked at any desired point. Neither ashes nor soot can collect back of the Majestic Dome Damper, because the damper is centre bearing and can be regulated so that soot and ashes fall into the grate after the damper is opened.

Front.	Throat.	Weight Crated
24"	18" x 10"	30 lbs.
30"	24" x 10"	35 lbs.
36"	30" x 10"	40 lbs.
42"	26" x 10"	50 lbs.
48"	42" x 10"	60 lbs.



FRONT VIEW.

END VIEW.

A copy of our Majestic building specialty catalogue will be gladly sent to any architect upon request.

THE GEO. M. HENDRY CO., LIMITED

SCHOOL EQUIPMENT OF ALL KINDS.

215 VICTORIA STREET,
TORONTO.

PRODUCTS.

SLATE AND HYLOPLATE BLACKBOARDS; SCHOOL FURNITURE; GENERAL SCHOOL EQUIPMENT.

PYRAMID BRAND SLATE BLACKBOARD.

"PYRAMID BRAND" SLATE BLACKBOARD is the highest grade cut for school purposes. A large stock carried at our Toronto Warehouse. Prices on application.

HYLOPLATE BLACKBOARD.

HYLOPLATE is the best composition blackboard made anywhere, and is guaranteed for ten years by the manufacturers when properly installed and used.

We can supply slabs in standard widths of 3, 3½ and 4 feet, and lengths of 6, 8, 10 and 12 feet. Further particulars and prices on application.



"PRESTON" BALL-BEARING DESKS.



"PRESTON"

BALL-BEARING AUTOMATIC DESKS
in Adjustable and Ordinary Styles.

MADE IN CANADA.

Write for full particulars and prices.

CHEMISTRY AND SCIENCE TABLES

Massive in construction and complete in equipment, made of oak and fitted with acid-resisting top. Write for detailed description.

We can offer various other high grade laboratory tables to meet every school requirement.

Full particulars and prices on application.



DOMESTIC SCIENCE TABLES



This is a "standard" table, or in other words, it embodies the fulfilment of all usual requirements.

Full particulars of construction and equipment, together with prices, will be furnished on application.

CONDUITS COMPANY LIMITED

TORONTO, ONTARIO.

HEAD OFFICE AND WORKS:
33 LABATT AVENUE.

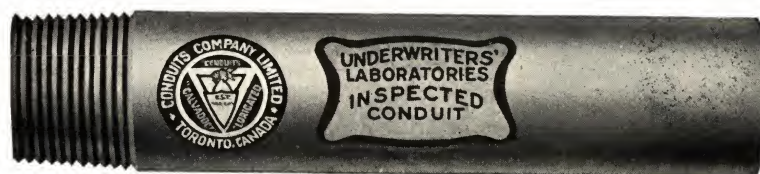


PRODUCTS.

"GALVADUCT" AND "LORICATED" IRON ARMoured CONDUITS FOR INTERIOR CONSTRUCTION. Manufactured by us under Patents.

GENERAL.

The Conduit System is the only absolutely safe method of wiring. It eliminates all risk of fire through defective wiring, lessens insurance risks, protects the wiring from all possible damage and makes it possible to easily and quickly re-wire, without tearing up flooring, cutting into plaster, etc., etc.

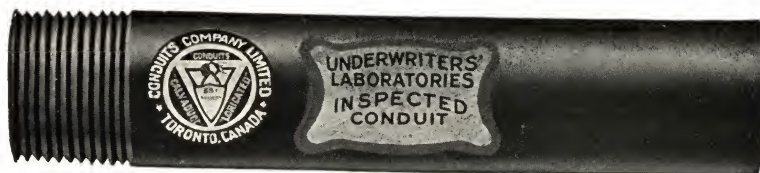


GALVADUCT.

"GALVADUCT" CONDUIT.

"Galvaduct" Conduit is manufactured from best quality mild steel welded tubing of gas-pipe thickness of wall. All tubes are thoroughly cleaned of silicates, scale and burrs, the ends carefully reamed to facilitate the fishing of wires, and then electro-galvanized on the outside and coated on the inside with a superior and flexible enamel, which gives absolute protection from rust or the action of acids and alkalis contained in plaster and cement.

We call particular attention to the fact that the threads of "Galvaduct" Conduit, being clean and free from any insulating substances, electrical conductivity is secured at each joint; it is therefore positive that, when properly grounded at any point, the metal of the entire conduit system is "permanently and effectually grounded" as required by the Rules and Requirements of the National Board of Fire Underwriters. With enamelled threads, this grounding is entirely problematical.



LORICATED.

"LORICATED" CONDUIT.

"Loricated" Conduit is manufactured with the same care and from the same quality of material as used in "Galvaduct" Conduit, but, in place of being electro-galvanized, all tubes are coated outside and inside with a superior flexible and moisture-proof enamel, which renders it impervious to the action of acids and other chemicals. "Loricated" Conduits are coated and "baked" three times, which results in a finish which will not "crack" or "scale" even when bent in coldest weather, and renders the pipe moisture and acid proof.

APPROVAL OF UNDER- WRITERS.

"Galvaduct" and "Loricated" Conduits are made in standard lengths of ten feet, threaded on both ends with one coupling to each length, and each tube bears our name and the Underwriters' Inspection Label.

Our Conduits are included in the list of conduits examined under the standard requirements of the National Board of Fire Underwriters and by the Underwriters' National Electric Association, after exhaustive tests by the Underwriters' Laboratories and have their approval.

STOCK CARRIED.

We are at all times in a position to make prompt shipment of large orders, as we always carry an extensive stock of all sizes of Conduits, Couplings and Elbows, both in Toronto and Montreal.

REMARKS.

Electrical Conduits for interior construction have developed through various types of wood moulding, paper tube, thin sheet metal encasing paper, wood or composition and heavy iron or steel tubing lined, until they reached their highest state of perfection in "Galvaduct" and "Loricated" Conduits as manufactured in Canada solely by Conduits Company Limited, under Canadian and United States Letters Patent.



WIREMOLD.

"Wiremold" is designed to meet the demand for a superior surface wiring material. It is made in two wire size only— $\frac{3}{8}$ " wide and $\frac{1}{8}$ " thick over all, and is furnished in ten-foot lengths. The base and capping is permanently assembled at the factory, hence conductors cannot be laid into it as in similar materials, but must be fished in all cases. "Wiremold" Base is galvanized and its capping finished with special high-grade enamel of a neutral tint, particularly selected to blend with colourings of average walls and ceilings.

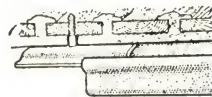


FIG. 2.

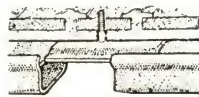


FIG. 3.

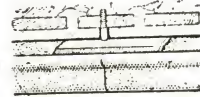
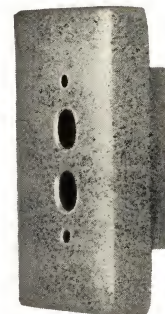


FIG. 4.

INSTALLATION.

To put up "Wiremold," just shove a coupling into the grooves of the capping, and screw it to the wall with a No. 8 flat head wood screw as indicated in Fig. 2 above. Start the grooves in the next length over the edges of the coupling as in Fig. 3. And close up as in Fig. 4. Certainly nothing could be more simple. And the beautiful part of this simplicity is that it applies to all fittings.

We make a very simple clip to support "Wiremold" in the middle of the length. You will find it listed in our pocket catalogue.

No. 515.
PLAIN TEENo. 584.
ELBOW CONDUIT COUPLING.No. 511.
FLAT ELBOW.No. 532.
OUTLET BOX.No. 550.
PUSH SWITCH BOX
AND COVER.

FITTINGS.

"Wiremold" Fittings are specially designed and are made to suit every requirement. Write for special catalogue, prices, etc.



NATIONAL CONDUIT COMPANY, LIMITED

HEAD OFFICE AND WORKS: QUEEN AND DUFFERIN STREETS,

TORONTO, ONT.

PRODUCT AND SERVICE.

We are sole manufacturers of "XCELADUCT" GALVANIZED and "ORPENITE" ENAMELLED RIGID STEEL CONDUIT for interior construction.

We carry a large and well-assorted stock of both "Xceladuct" and "Orpenite" Conduits at Toronto, and can at all times make prompt shipments of large orders.

"Xceladuct"



"Xceladuct"

DESCRIPTION "XCELADUCT" CONDUIT.

Is a high-grade Mild Steel Tube made absolutely rust-proof by the finish given the raw pipe before electro-galvanizing. It bends easily. Sharp, clean-cut, zinc-coated threads save the labour of re-threading and render bonding wires or ground clamps unnecessary.

"XCELADUCT" zinc coating is a uniform and continuous deposit of pure zinc. There is no possibility of an alloy since the zinc is deposited directly on the Mild Steel Tubing—and its full value as a rust-preventive is secured.

"XCELADUCT" bonds with concrete. Its surface is absolutely clean, so that concrete wets it thoroughly and bonds with it without allowing the formation of pockets, in which corrosive elements might accumulate.

"XCELADUCT" enamelled interior is entirely free from blisters, burrs or any obstructions. Its smooth, glossy surface allows rapid fishing without injuring the insulation of the wires.

DESCRIPTION "ORPENITE" CONDUIT.

The same grade of pipe is used in the manufacture of "ORPENITE" Conduits as in "XCELADUCT," which after being cleaned by the same method, is coated both inside and outside with flexible black enamels, which have been selected with the utmost care as to finish, lustre, elasticity and durability, being acid-resisting, and are not affected by any dampness in walls or contact with lime, mortar or cement. The wires are constantly free from every disturbing influence on the insulation.

APPROVAL OF UNDERWRITERS.

Each tube is ten feet long, "threads" on both ends, with coupling, and bears Underwriters' Inspection Label and label bearing our name.

"Orpenite"



"Orpenite"

PRICE LIST.

"XCELADUCT" GALVANIZED AND "ORPENITE" ENAMELLED CONDUIT COUPLINGS AND ELBOWS.

CONDUIT.							COUPLINGS.			ELBOWS.			
Size.	Price per Foot.	DIAMETERS.		Thick-ness.	Weight per Foot.	Threads per Inch.	Size.	Price Each.	Wt. per 100 in lbs.	Price Each.	Wt. per 100 in lbs.	Radius. Inches.	Offset. Inches.
		External.	Internal.										
1/2	\$0.08 1/2	.540	.364	.088	.425	18	1/2	\$0.05	6.0	\$ 0.19	42	4.250	7.500
3/4	.08 3/4	.675	.493	.091	.568	18	3/4	.06	9.5	.19	53	4.250	7.500
1	.08 1/2	.840	.622	.109	.852	14	1	.07	11.6	.19	75	4.250	7.375
1 1/2	.11 1/2	1.050	.824	.113	1.134	14	1 1/2	.10	20.9	.25	120	5.375	8.375
2	.17	1.315	1.049	.133	1.684	11 1/2	2	.13	34.3	.37	200	5.750	9.500
2 1/2	.23	1.660	1.380	.140	2.281	11 1/2	2 1/2	.17	53.5	.45	300	7.250	10.875
3	.27 1/2	1.900	1.610	.145	2.731	11 1/2	3	.21	74.3	.60	427	8.250	12.625
3 1/2	.37	2.375	2.067	.154	3.678	11 1/2	3 1/2	.28	120.8	1.10	700	9.500	15.250
4	.58 1/2	2.875	2.469	.203	5.819	8	4	.40	172.0	1.80	1300	10.500	17.375
4 1/2	.76 1/2	3.500	3.068	.216	7.616	8	4 1/2	.60	249.8	4.80	1700	13.000	19.500
5	.92	4.000	3.548	.226	9.202	8	5	.80	424.1	10.60	2300	15.000	21.250
6	1.09	4.500	4.026	.237	10.889	8	6	1.00	474.1	12.25	2700	16.000	22.500
	1.27	5.000	4.506	.247	12.642	8		1.50	550.0	18.55	3100	18.000	24.375
	1.48	5.563	5.047	.258	14.810	8		1.65	700.0	25.75	5500	24.000	32.000
	1.92	6.625	6.065	.280	19.185	8		2.40	750.0	32.00	9000	30.000	39.750

Conduits in 10-foot lengths threaded on both ends with one coupling.
Conduit pipe is known and spoken of by its nominal inside diameter.

CANADIAN TRIANGLE CONDUIT COMPANY, LIMITED

OFFICE AND WORKS: 21 PRESCOTT ST., TORONTO.

GENERAL SALES AGENTS:
CONDUITS COMPANY, LIMITED,
33 Labatt Ave., TORONTO.



PRODUCTS.

- "TRICABLE" (Flexible Steel Armored Conductor).
- "TRISTEEL" (Flexible Steel Conduit).
- "TRIDUCT" (Flexible Non-Metallic Conduit).
- "TRIHOSE" (Flexible Metallic Gas Hose).
- "TRITUBE" (Flexible Metallic Automobile Tubing).
- "TRICORD" (Hard Service Portable Cord).

We have a competent staff who are always pleased to consider and advise on any points that may come up in the use of our products. If the occasion presents itself, we hope you will take advantage of this service.

"TRICABLE."

Flexible Armored Conductor. A well-insulated electric conductor, single or twin, protected by a spirally wound, interlocking steel strip, so designed that it will not open when bent, is extremely flexible, is practically impervious to nails. Its use in buildings of mill construction type gives a high degree of protection, and a neat and thorough mechanical job. For outside extension work, such as electric signs, or any underground work, we manufacture "TRICABLE" Armored Conductors, with a lead sheath over the conductors, and our flexible steel covering over all.

"TRISTEEL."

Flexible Steel Conduit. Is manufactured on the same patented machinery and under the same process as "TRICABLE." We manufacture "TRISTEEL" Flexible Conduit in sizes up to and including 1½ in., and carry a complete stock. For motor installations "TRISTEEL" is particularly adaptable. It allows the finished conduit to be bent around projections on a close angle as small as a 2 in. radius.

"TRIDUCT."

Single Wall, Non-Collapsible, Non-Metallic Flexible Conduit. "TRIDUCT" is of knitted construction consisting of circumferential loops of rib-like form running parallel with the race way, thus insuring easy insertion of a maximum sized wire. The construction of "TRIDUCT" assures you of an undamageable product and is a thorough and complete departure from the usual practices under which Loom has been heretofore manufactured.

All Triangle products are manufactured and labelled under the supervision of the Underwriters' Association.

Where you have use for materials which are manufactured by the Canadian Triangle Conduit Company, Limited, if you will specify our trade name and insist upon your order being filled as specified, you will be assured of

QUALITY, SERVICE AND ECONOMY.



THE ABOVE SHOWS A COIL OF ½" "TRISTEEL" FLEXIBLE STEEL CONDUIT.



THE HOLTZER-CABOT ELECTRIC CO. ELECTRIC SIGNALING SYSTEMS.

HOME OFFICE AND FACTORY:
125 AMORY STREET, BOSTON, MASS.

BRANCH OFFICES:

6161-65 SO. STATE ST., CHICAGO, ILL. 1104 UNION TRUST BLDG., BALTIMORE, MD. 101 PARK AVE., NEW YORK, N.Y.
517 UNION BLDG., CLEVELAND, O. 807 OTIS BLDG., PHILADELPHIA, PA. 408 CLAUS SPRECKELS BLDG., SAN FRANCISCO, CAL.

MANUFACTURERS OF

Factory Signaling Systems
Fire Alarm Systems
Watchmen's Recording Systems
Fire and Watch Systems
Indicating Systems
Nurses' Calling Systems

Horn Calling Systems
Factory Calling Systems
School Signal Systems
Fractional Horse-Power Motors
Motor Generators
Dynamotors

HOSPITAL CALLING SYSTEMS.

The simplicity and convenience of Holtzer-Cabot Systems is largely due to the patented Push Locking Button which contains all the working parts. Lighting of lamps, sounding of buzzers, operation of annunciators are all controlled from the button. This type of safety-operating button is exclusive to the Holtzer Cabot Systems.

Should a station become temporarily out of order, a nurse or attendant can readily plug in another cord and button; there can be no interruption of service at that station or any other station; this is because there are no mechanical or electrical contrivances within the walls—simply the wires coming to a standard wall plate.

The button locks when pressed by the patient and operates the various Signals considered necessary. It is only at the patient's bedside that the Signals may be extinguished by the nurse.

These simple, safe, reliable Systems are operated from any 10-volt source of current (direct or alternating). A transformer, motor generator set, or storage battery of adequate capacity, giving normally 10 volts may be used. While we manufacture Signaling Apparatus of the relay, solenoid, high or low voltage types, we recommend emphatically the low voltage System with Push Locking Button. It precludes all possibility of serious shock to the patients, should cords become worn.

During the course of construction and reconstruction is the most satisfactory time for installing a Signaling System; but Holtzer-Cabot Systems may be very readily installed in existing institutions with very little trouble and expense.

We will be glad to co-operate with any architect who may be interested in Hospital Signaling Systems.

FIRE ALARM SYSTEMS.

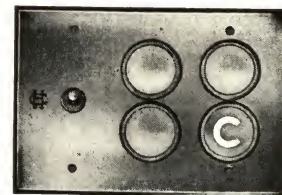
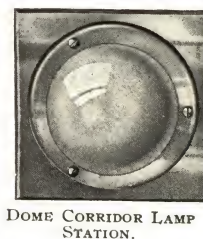
Even in "fire-proof" buildings, Fire Alarm Systems are necessary to avoid panic. It has been truly said that the first five minutes in fire-fighting is worth more than the next five hours. Every fire starts small, and, arrested in time will never grow into a big fire.

The Holtzer-Cabot Electric Company specialize in the manufacture of fire alarm systems suitable for practically all classes of service. These fire alarm systems are designed particularly for the type of building in which they are to be installed, and the type of service required, i.e., for schools, hospitals, hotels, factories, warehouses, banks, etc. Send us your requirements and our engineers will be pleased to supply you blue-prints, specifications and complete data for a "safety-first" system for any building.

AD BELL.

This is an entirely new type of signal or alarm bell for use on alternating current. The hammer operates entirely independent of the frequency; therefore, the gong is struck a succession of powerful blows, with a slight interval of time between each. Resonance is thus brought out making the AD Bell an extremely loud and penetrating type of signal or alarm.

There are bulletins issued to assist the architect in his work, describing and illustrating in detail all Holtzer-Cabot products. Any of these bulletins will be forwarded on request.



GENT & COMPANY, LIMITED
LEICESTER, ENGLAND

AGENT

WM. ASHALL

442 SHERBOURNE ST., TORONTO, CANADA

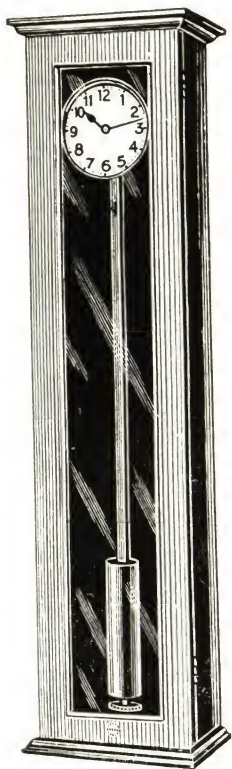


FIG. C7.
TRANSMITTER
'I CONTROL ALL.'

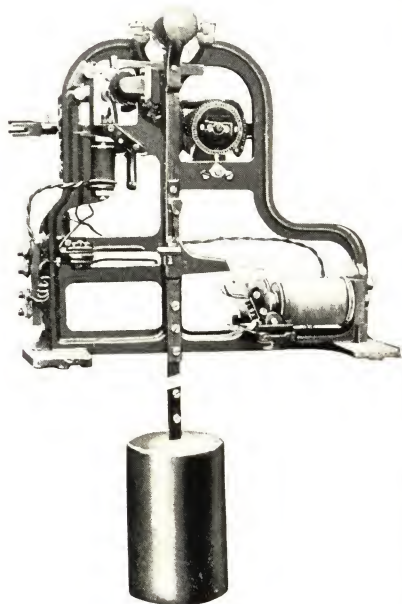


FIG. C40.
WAITING-TRAIN MOVEMENT FOR
DRIVING THE HANDS OF TURRET CLOCKS,
PROVIDING ADDITIONAL POWER AGAINST
ADVERSE WEATHER CONDITIONS.

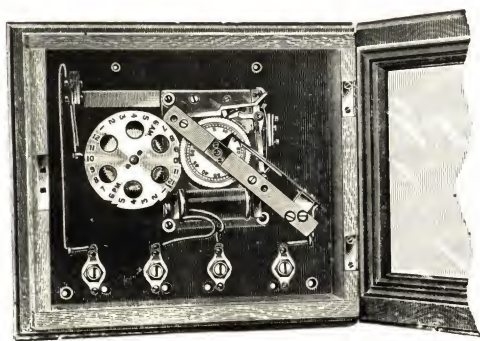
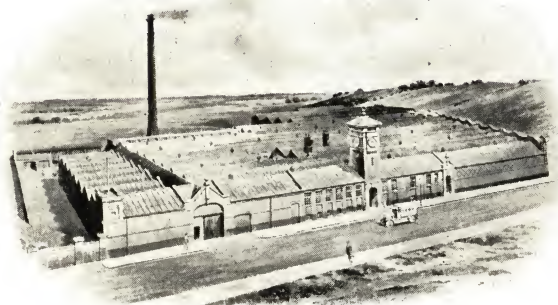
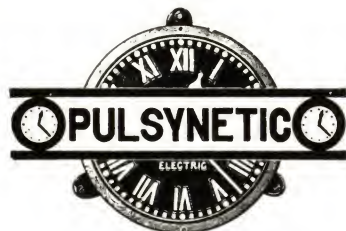


FIG. C68.
CONTACT MAKER FOR OPERATING SYRENS,
HOOTERS AND BELLS.



FARADAY WORKS.

ELECTRIC CLOCK SYSTEM,
TOWER CLOCKS,
SCHOOL PROGRAMME CLOCKS,
ELECTRIC CLOCKS OF EVERY
DESCRIPTION.



REFERENCES WHERE THESE CLOCKS
ARE INSTALLED:

New Parliament Buildings, Ottawa, Ontario.
Memorial Tower, Niagara-On-The-Lake, Ont.
C. P. R. Station, North Toronto.
Dominion Bank, Head Office, Toronto.
Gutta Percha Rubber Co., Toronto.
Mutual Life Assurance, Co., Waterloo, Ont.
Sun Life Assurance Co., Montreal, Quebec.
Etc., Etc., Etc.

All information with regard to
Electric Clock Systems may
be obtained and Catalogues
supplied.

Apply

WM. ASHALL
442 SHERBOURNE STREET
TORONTO, ONT.



FIG. C10.
AIR-TIGHT WOODEN CASE FOR OFFICE, SCHOOL,
INSTITUTE AND DUSTY SITUATIONS.



FIG. C24.
CAST-IRON, WATER-TIGHT CLOCK,
HERMETICALLY SEALED FOR WORKS, WAREHOUSE,
UNDERGROUND USE AND EXPOSED POSITIONS.



TURRET CLOCK WITH SKELTON DIAL ON OPEN
BACKGROUND, VISIBLE FROM A GREAT DISTANCE.

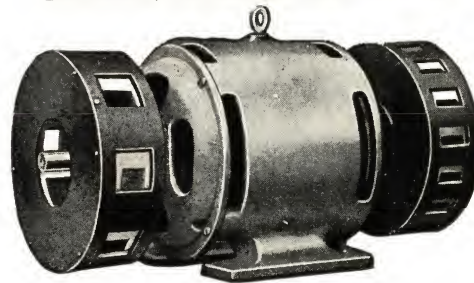


FIG. 1448.
SYREN, DESIGNED AS "START AND CEASE WORK" SOUNDER
BUT IS EQUALLY SERVICEABLE AS A FIRE ALARM, ETC.



NORTHERN ELECTRIC COMPANY, LIMITED

MONTREAL.
QUEBEC.
HALIFAX.
OTTAWA.

TORONTO.
HAMILTON.
LONDON.
WINDSOR.
WINNIPEG.

REGINA.
CALGARY.
EDMONTON.
VANCOUVER.



RUBBER INSULATED WIRES AND CABLES

We have standardized three grades of Rubber Insulated Wires—"Adanac," Imperial Higrade" and "Adanac 30% Para." These wires are approved by the National Board of Fire Underwriters and are used principally for wiring buildings. All our Rubber-Covered Wires and Cables, sizes No. 6 AWG and larger, are covered with a tape and braid or a double braid, and are suitable for unlined conduit work. N. E. Code rules allow a single braid on all wires smaller than No. 6 AWG. We supply both single and double braid as required.



NO. 10 SOLID SINGLE BRAID WIRE

"ADANAC" RUBBER INSULATED WIRE

"Adanac" Wire meets all the requirements of the National Board of Fire Underwriters. Each coil is tested before leaving the factory and receives the stamp of the Wire Inspection Bureau. The conductors are thoroughly tinned and covered to code thickness with a good grade of rubber compound which is thoroughly vulcanized. Over the insulation is applied one or more braids of standard cotton yarn. These braids are thoroughly saturated with a weatherproof compound and finished with a wax compound of high melting point. The smooth hard finish given to these wires makes them especially desirable for conduit work.

"Adanac" Wire can also be finished with white fireproof compounded outer braid. We also supply single or multiple conductor rubber insulated cable with lead sheath overall.

Marker: Yellow thread woven in the braid.

"ADANAC 30% PARA"

These wires and cables are exactly the same as the "Adanac" Wires mentioned above with the exception that a special insulating compound containing 30% Para Rubber is used instead of the ordinary code compound. They will be found extremely satisfactory for special high voltage work or for very severe service conditions. As with Adanac code each coil is tested and stamped with the Underwriters' label before leaving the factory.

Marker: Yellow thread woven in the braid.



"IMPERIAL HIGRADE"

There is a big and ever-increasing demand for a rubber-covered wire which is better than code standard and not so expensive as 30% Para. Imperial Higrade has been developed to meet this demand and is a grade generally supplied on special or high-class building work. In elasticity, tensile strength and dielectric qualities, the compound is superior to code standard. It is easily distinguishable from code wire by reason of the red outer braid, through which is woven spirally a dark blue thread. The preservative wax with which this braid is impregnated is transparent. Each coil is tested and stamped with the Underwriters' label before leaving the factory.

Marker: Blue or Black thread woven in the braid.

"Adanac" Elevator Bell Cable.—Conductors composed of 16 No. 30 A.W.G. annealed copper wires, stranded together insulated with a fine and a coarse cotton serving in reverse directions and braided; conductors are stranded together, covered over all with a white cotton braid, and finished with a colored soft cotton braid. The individual conductors are braided so as to be easily distinguishable one from another.

"Annunciator" Wire is insulated with two winds of cotton yarn applied in opposite directions, saturated with our special wax compound and highly polished. Furnished in colors and styles as follows: White, red, blue, brown, green, black, red-white, blue-white, green-white, brown-white, and blue-brown.

"Weatherproof" Annunciator Wire.—The same as above, saturated with weatherproof compound, finished in black only.

Damp-proof Office Wire.—Insulated with two winds of cotton yarn applied in opposite directions, saturated with our regular black weatherproof compound, then braided and specially treated with wax. It is highly polished and will not collect dust. Office Wire is made in the combination colors, red and white.

FLEXIBLE CORDS

Flexibility is the predominating feature of our standard and special flexible cords. They consist of small extra flexible copper conductors, insulated and protected in a manner suitable for the service which will be required of them. The conductors consist of a number of small individual copper strands cabled together. A cotton separator is used to minimize chemical action between copper and the rubber insulation. This separator also serves to keep broken strands from puncturing the insulation. The insulation consists of a rubber compound which meets all the requirements of the latest N.E. Code.

We can supply any of the numerous cords which have been approved by the Underwriters' for different purposes.

We carry a large stock of all the standard cords.

The cords are shipped in cartons of the type shown in the accompanying illustration.

Marker: Two Yellow threads cabled with a copper strand.



ECONOMY FUSE & MFG. CO. OF CANADA, LIMITED

UNITY BLDG., MONTREAL, CANADA.

MANUFACTURERS OF

ECONOMY RENEWABLE CARTRIDGE AND RENEWABLE PLUG FUSES.

"DROP OUT" RENEWAL LINKS.

NON-RENEWABLE PLUG FUSES.

S & C HIGH POTENTIAL FUSES.

COMPLETE STOCKS CARRIED BY ALL LEADING JOBBERS.

ECONOMY FUSES are made in three general types (ferrule, plug and knife blade), with a full line of capacity ranges for all commercial voltages. This was the first line of fuses employing an inexpensive bare link for restoring a blown fuse to its original efficiency, to be approved in all capacities by the Underwriters' Laboratories, Inc., established and maintained by the National Board of Fire Underwriters.

The fusible elements are of the "Drop Out" Renewal Link type, accurately rated and of definite design. Every part of an Economy Fuse is built on the "safety first" principle, which means that the design is right from an electrical standpoint, and that material entering into the construction of the completed fuse is the best that money can buy.

IMPROVED ECONOMY RENEWABLE FUSE—Study the renewable link feature. See the two narrow bridges of metal holding the "Drop Out" features in place. In operations on short circuits, these two bridges fuse. The entire fuse metal does not volatilize, only the two narrow bridges. This very greatly decreases the danger factor due to the tremendous pressure generated when an entire strip of fusible metal is instantly converted into gases. No powdered filler to deteriorate or solidify. Only the fuse metal is destroyed; the fuse itself is ready for years of service. See the new winged washer which makes it simple and easy for any one to replace the "Drop Out" renewal link in a few minutes.

ECONOMY FUSE SAVINGS—There is 80% of fuse maintenance cost saved yearly, as compared to the cost of securing adequate protection by the use of non-renewable "one-time" fuses.

ECONOMY FUSE USERS—Users include industrial plants, large corporations, light and power companies, arms and munition plants, powder mills, mining and smelting companies, department and large stores, publishing companies, flour mills, food product plants, hotels, theatres, public buildings, steamships, wireless stations, ashore and afloat, and various departments of the United States Government.

WHY ECONOMY APPROVED RENEWABLE FUSES ARE USED—Because Economy Fuses cut yearly fuse costs 80% and furnish proper protection under all conditions of service. Unlike "one-time" fuses, which are discarded after operation, Economy Fuses are used over and over again to obtain complete protection against the fire and accident hazards of overloads, short circuits, and the effects of lightning discharges on electrical circuits.



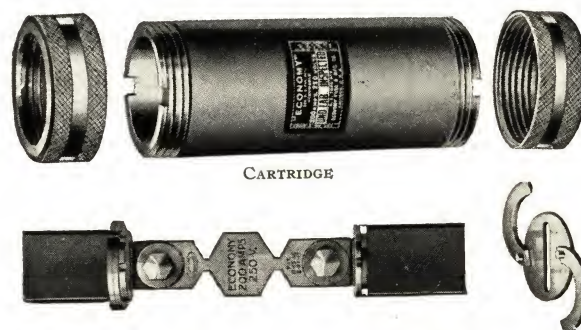
SECTIONAL VIEW—KNIFE BLADE TYPE.



FERRULE TYPE. FUSE AND "DROP OUT" RENEWAL LINK.

"DROP OUT" RENEWAL LINK—It is the heart of an Economy Fuse. It instantly restores a blown Economy Fuse to its original efficiency at the absolute minimum of cost. A stock of "Drop Out" Links, always on hand, represents a small investment.

ECONOMY KNIFE BLADE TYPE FUSE DISASSEMBLED.



CARTRIDGE

"DROP OUT" RENEWAL LINK AND WINGED WASHER

ECONOMY RENEWABLE PLUG FUSES—Use of the "Drop Out" renewal link in this plug type fuse results in similar operation and saving as in the Economy cartridge type fuses. No tools are required to replace the blown link and restore the plug to its original efficiency.



PLUG TYPE FUSE.

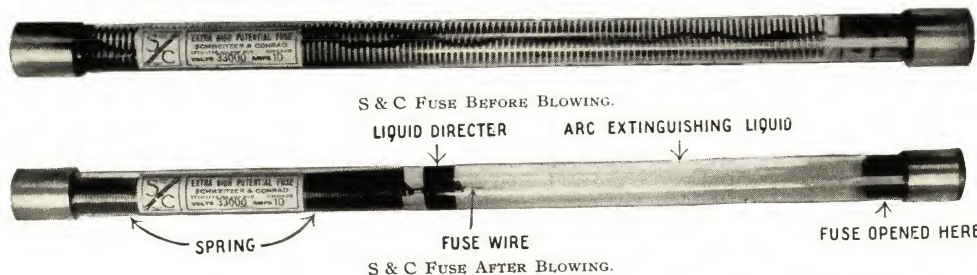
SECTIONAL VIEW.

"DROP-OUT" RENEWAL LINK.

SAMPLES—Any capacities sent on request, provided they are to be used for comparison and tests.

Sole manufacturers in Canada of the famous "S & C" High Potential Fuses for use on lines of over 2,500 volts.

S & C HIGH POTENTIAL FUSES—FOR LINES OVER 2,500.



S & C FUSE BEFORE BLOWING.

LIQUID DIRECTOR ARC EXTINGUISHING LIQUID

SPRING

FUSE WIRE

S & C FUSE AFTER BLOWING.

FUSE OPENED HERE

"S & C" EXTRA HIGH POTENTIAL FUSES.

Are rapid and positive in operation.
Clear the circuit and limit the rush of current to a minimum.
Do not endanger nearby apparatus.
Effect a big saving in investment.
Facilitate the location of trouble and blown fuses.



JEFFERSON GLASS COMPANY, LIMITED

FACTORY AND HEAD OFFICE:
TORONTO, CANADA.

BRANCH OFFICES:

MONTREAL.

WINNIPEG.

VANCOUVER.



ILLUMINATING GLASSWARE.

Over 3000 styles and designs to select from, comprising glassware for every lighting purpose.

"SOL-LUX". Our high efficiency glass. It is especially adaptable for use with nitrogen lamps.

"MOONSTONE." The highest quality of semi-translucent glass. Made in heavy pressed and blown pieces.

"MONOLUX." The new soft golden amber glass. Finished with mother-of-pearl exterior and etched designs.

"AMBER." Genuine amber in all shapes and sizes. Finished in all etched designs.

"CRYSTAL." Our crystal glass is of the highest quality. Finished in various decorations, tints, and etchings.

"RUBY." All that the name implies—Genuine Ruby—not red. For exits, hallways, fire escapes, danger lights, etc.

COLORED GLASS. Special Colors for all requirements.

DECORATIONS. Our Decorating Department is equal to any on the continent.

"HAND PAINTED."

"ETCHED."

"ETCHED AND
COLORED."

"TINTED."

"ENAMEL."

"SAND BLAST."

"SATIN FINISH."

"CRACKLED
FINISH."

"CUT DESIGNS."

PORTABLE LAMPS.

"HAND DECORATED."

"ETCHED."



No. 396.

ILLUMINATING GLASSWARE.

"SEMI-DIRECT
BOWLS."

"SHADES."

"GLOBES."

"BALL GLOBES."

"REFLECTORS."

"CYLINDERS."

"STALACTITES."

"LANTERNS."

"MARINE BOWLS."

"CEILING BOWLS."

"WALL PIECES."

"HEMISPHERES."

COMMERCIAL UNITS.

"DUSTPROOF."

"DUSTPROOF JR."

"ENAMELITE."

"JEFFERSONLITE."

"DOMINIONLITE."

SUNDRY SUPPLIES.

BATTERY JARS.

LIGHTNING ROD
BALLS.

LENS (ALL DESIGNS).

TABLEWARE ETC.

TUMBLERS.

MANUFACTURING
SUPPLIES

INFORMATION. We will gladly supply any information to architects and engineers

TALLMAN BRASS & METAL LIMITED

ARCHITECTURAL AND ORNAMENTAL METAL WORK.

HAMILTON, CANADA.

RAYLITE

LIGHTING FIXTURES



RAYLITE No. 2813.



RAYLITE No. 2811.



RAYLITE BRACKET.

LIGHTING
EFFICIENCY.

The vitreous enamel surfaces of the concave reflector are independent of the color of the ceiling and give maximum light on the working plane with even distribution. The cased glass diffusing bowl radiates a soft white light with low absorption.

The exceptional efficiency of this light is shown by actual tests, copies of which will be sent upon request.

MAINTEN-
ANCE.

Gas filled lamps of low current consumption are used. Thorough ventilation gives long life to the lamps with small decrease in their efficiency.

Releasing one supporting wire gives access to the lamp and interior of the bowl. The smooth glass surfaces of the reflector and bowl do not collect dust readily and are easily washed.

SIZES,
DESIGNS,
INSTALLA-
TION.

The mechanical features of RayLite are simple, and it is easily installed. Sizes and types are furnished for every need. Architects or builders are invited to let us know their requirements or complete descriptions will be sent upon request.

THE UNITED ELECTRIC CO., LTD.

MANUFACTURERS OF
ELECTRICAL VACUUM CLEANERS—STATIONARY AND PORTABLE.
TORONTO, ONT.

PRODUCTS.

TUEC (ELECTRIC) STATIONARY VACUUM CLEANER.

OHIO-TUEC (ELECTRIC) VACUUM CLEANERS (PORTABLE).

We have installed more stationary cleaning systems than the total output of all other manufacturers combined—and everyone is in operation.

TUEC 260.

Our new TUEC 260 is a perfected stationary vacuum cleaning unit, specially designed for the modern house. It is the same TUEC cleaning outfit in every respect excepting capacity only, that of late years has been accepted by Architects generally as almost standard equipment for the first residences in the United States and Canada.

It unquestionably provides the easiest and quickest and beyond any comparison the most sanitary, thorough and economical method of cleaning for any residence.

The installation cost of the new TUEC 260 unit complete is so small compared to the many savings it effects, as to make it a real economy in any home.

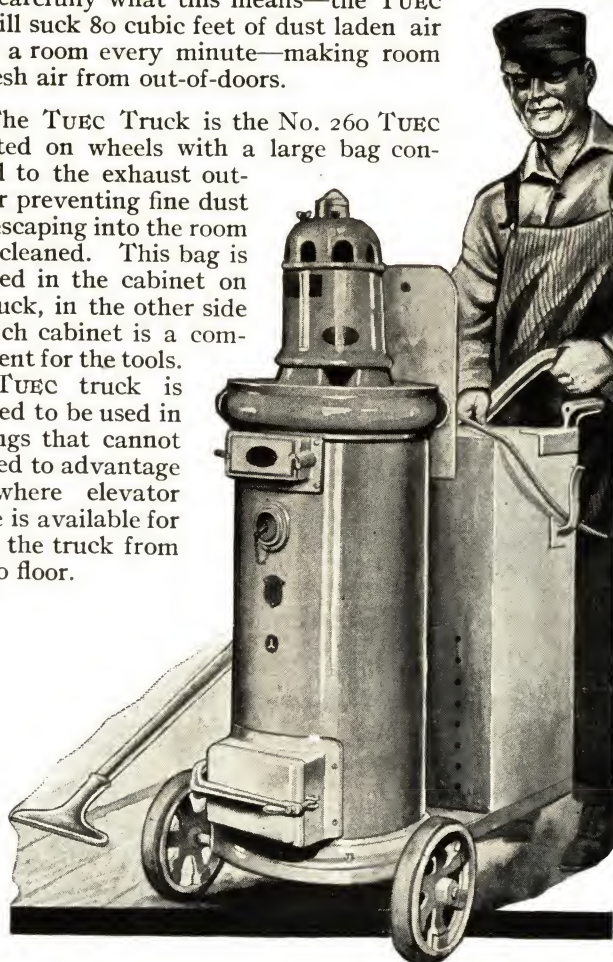
In addition to cleaning floors, walls, furnishings and clothing in the home the TUEC 260 actually changes the very air in every room.

The working end of a TUEC handle has a suction capacity of 80 cubic feet of air in a minute. Consider carefully what this means—the TUEC 260 will suck 80 cubic feet of dust laden air out of a room every minute—making room for fresh air from out-of-doors.

TUEC No. 260 TRUCK.

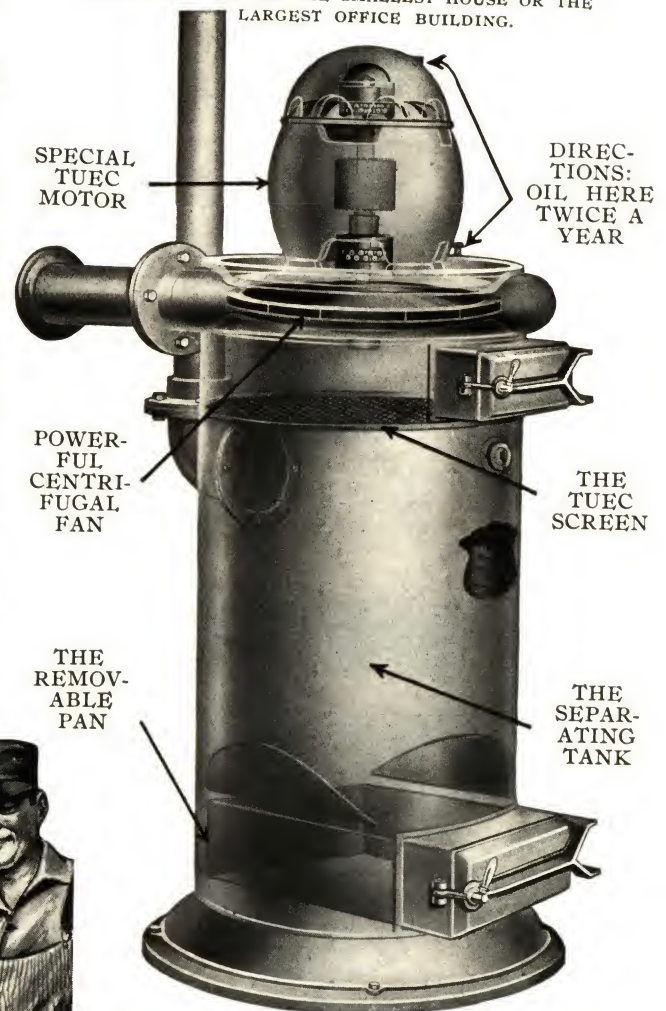
The TUEC Truck is the No. 260 TUEC mounted on wheels with a large bag connected to the exhaust outlet, for preventing fine dust from escaping into the room being cleaned. This bag is installed in the cabinet on the truck, in the other side of which cabinet is a compartment for the tools. The TUEC truck is designed to be used in buildings that cannot be piped to advantage and where elevator service is available for taking the truck from floor to floor.

OFFICES
AND PUBLIC
BUILDINGS.



THE TUEC (VACUUM CLEANING) MACHINE.

SIZES SUITABLE FOR THE SMALLEST HOUSE OR THE LARGEST OFFICE BUILDING.



The TUEC Machine is made in six sizes. The smallest is the Universal type motor and adapted to homes and small office buildings; the five larger sizes are adapted to large office and other public buildings, and are made to accommodate piping systems ranging up to 2,000 feet.

A regular set of tools and accessories goes with this truck the same as is furnished with the stationary installed No. 260. This portable No. 260 is being sold to many building owners who want the service of a TUEC Cleaner even though the stationary plant cannot be conveniently installed on account of the difficulty of piping the building after its erection.

The net weight of the No. 260 TUEC is 250 pounds. The crated weight of the outfit complete including accessories is 325 pounds. The dimensions of this machine are: Height, 52 inches; length, 41 inches; width, 25 inches; wheels, 9 inch diameter. This machine is equipped with rubber tires and is roller bearing.

We also make other and larger sizes of TUEC machines. The larger sizes are adapted to large office and other public buildings, and are made to accommodate piping systems ranging up to 2,000 feet.

THE PERMUTIT COMPANY

WATER RECTIFICATION.

WINNIPEG, MAN., CANADA:
STANLEY BROCK, LIMITED.

CALGARY, ALTA., CANADA:
Stanley Brock, Limited.

MAIN OFFICE:

440 FOURTH AVENUE,
NEW YORK.

HAMILTON, ONT., CANADA:
Main and McNab Streets,
W. J. WESTAWAY Co.

MONTREAL, QUE., CANADA:
400 McGill Bldg.,
W. J. WESTAWAY Co.

PRODUCTS.

WATER SOFTENERS OF ZEOLITE AND LIME-SODA TYPES; HEATER SOFTENERS; IRON, MANGANESE AND SULPHUR REMOVAL APPARATUS; FILTERS FOR REMOVING OIL FROM CONDENSATE; WATER FILTERS AND FILTRATION EQUIPMENT, PRESSURE AND GRAVITY TYPES; GENERAL WATER RECTIFICATION APPARATUS OF EVERY DESCRIPTION.



SOFT WATER FOR THE HOME.

A Permutit Water Softener System will give your clients a bountiful supply of sparkling soft water from every faucet in their house, no matter how hard and unsatisfactory the available supply is.

Permutit is a granular material on the order of sand that possesses the property of abstracting all the hardness from any water that is passed through it. The water softener is a metal tank containing Permutit which removes all hardness from the water as it passes through. For years Permutit Systems have been utilized industrially in mills, hotels, laundries, hospitals and similar places to render water pure, soft and clean for various exacting purposes. Hundreds of Permutit Water Softeners are in daily use in private homes, where soft water is supplied for drinking, cooking, washing and all domestic purposes. It is vastly superior to rain water, and free from the dangerous contaminations found in cisterns.

SIZE.

A Permutit Water Softener is a metal shell or tank, containing Permutit material, that is connected into the house supply line. It is offered in two sizes and six styles, which give an unlimited range of capacities according to the hardness of the water and quantity to be softened. Largest size requires 3' 0" x 6' 6" floor space and 6' 0" head room. Smallest size 2' 0" x 5' 6" floor space and 6' 0" head room. This includes necessary room for operation.

REGENERATION.

Permutit material is not consumed by the softening process, but is regenerated periodically and used for an indefinite length of time. When it has softened its designated quantity of water, common cooking salt is run through the Permutit bed. The salt restores the Permutit material to its original condition, and after draining off the surplus, it is in exactly the same condition it was at the beginning. The amount of attention required is but a few minutes a week, and anyone can learn to turn the necessary valves correctly.

CAPACITY.

Softeners are customarily designed with capacities to operate a week or ten days between regenerations. Meters are not included in standard equipment but are furnished on order as most houses have meters. Where no meters are used, the time for regeneration is determined by a soap test that is simple and accurate.

The capacity required for a given house is determined from the number of people in the household, the number of servants and the probable number of guests. This information together with an analysis of the water supply, which we make free of charge, is sufficient to make an estimate.

LOCATION.

Softeners may be located in the basement or any other convenient spot, and can be connected into the water supply line by any plumber. They are usually placed directly in the main feed line with a simple by-pass arrangement of valves.

SEWER CONNECTION. PRESSURE.

Sewer connection is customarily in the form of an open sump to avoid the backing up of sewer gases, but it is not necessarily confined to that form.

Standard designs are constructed to operate under pressures up to 100 lbs. per square inch. The normal pressure drop through the Softener does not exceed 5 lbs.

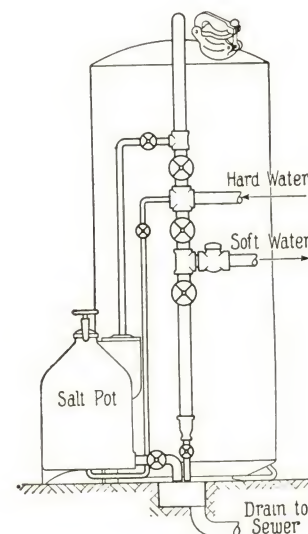
MATERIAL AND WORKMANSHIP.

Softener shells are made of steel. All valves are of the Crane and Jenkins standard, and workmanship throughout is the highest quality. Our many refinements in design and construction make a Permutit Softener a permanent and dependable fixture.

INFORMATION REQUIRED FOR ESTIMATES.

To properly estimate the size, capacity and cost of a Permutit Water Softener for any household the following information is required:

1. Number of people in house (including servants if any).
2. Height of ceiling in basement or other location.
3. Source of water supply, i.e., city, well, river, lake, etc. If the water supply is that of any good-sized city we have an analysis in our files; otherwise we need a half-gallon sample of the water, forwarded preferably in glass. Earthenware may be used if clean.

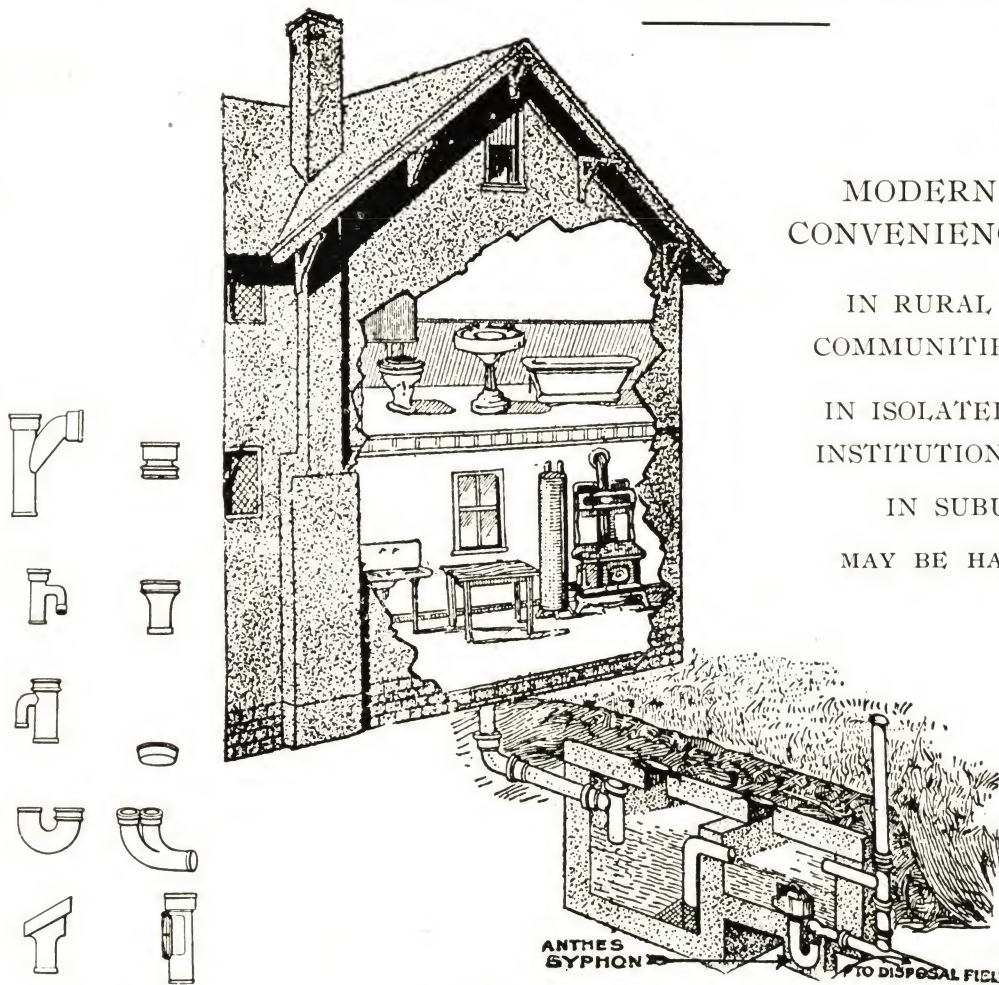


ANTHES FOUNDRY, LIMITED

EASTERN PLANT:
JEFFERSON AVENUE,
TORONTO.

MANUFACTURERS OF
CAST IRON SOIL PIPE AND FITTINGS.

WESTERN PLANT:
SASKATCHEWAN AVENUE,
WINNIPEG.



MODERN
CONVENIENCES

IN RURAL
COMMUNITIES

IN ISOLATED
INSTITUTIONS

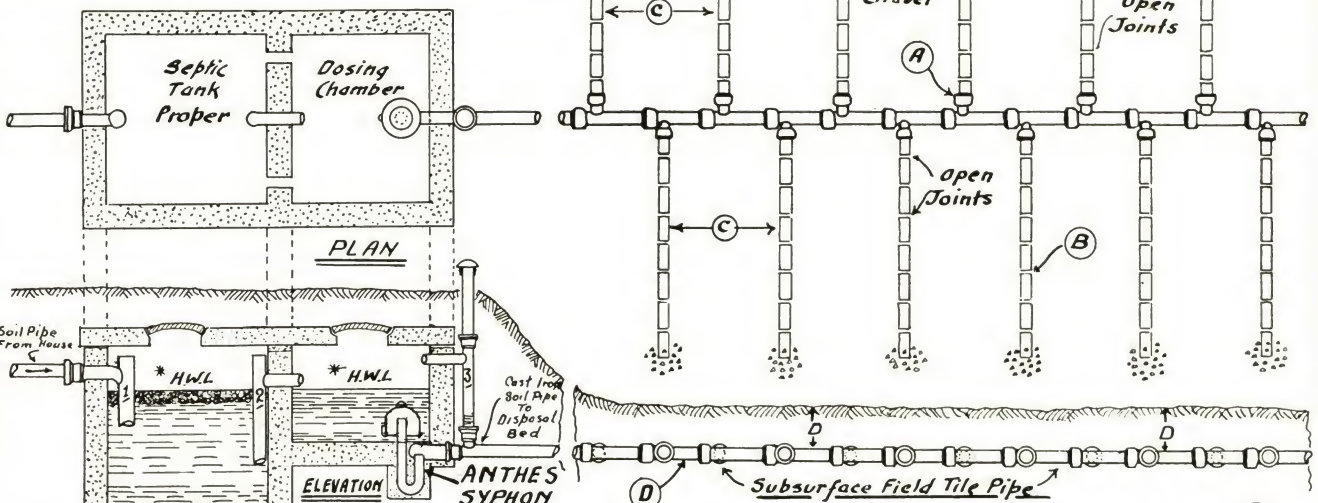
IN SUBURBAN HOMES

MAY BE HAD BY INSTALLING

ANTHES SYPHONS
FOR
SEWAGE DISPOSAL.



- A. All Hub Joints To Be Cemented
- B. All Open Joints To Be Covered With Coarse Gravel
Broken Stones or Cinders Etc.
- C. These Laterals Not To Be Less Than 3 Feet Apart
And Laid Level Joints Open 1/4" And Covered
- D. Not More Than 18 Inches Or Less Than 12" Below Surface



* H.W.L. Means High Water Level

Note Special Cast Iron Fittings For Septic Tanks. Numbers 1.2.3. (EN)

The "Anthes" Siphon is unconditionally guaranteed to discharge automatically, is practically indestructible, and has no moving parts to wear out, or get out of order.

WRITE FOR BULLETINS AND BLUEPRINTS.

WESTCO PUMPS, LIMITED

FACTORY AND OFFICE

Rumely Bldg., Queen & Abell Streets,
TORONTO, ONT.

Westco PUMPS & WATER SYSTEMS

Westco PUMP

DESIGN.

The WESTCO embodies a distinctly new idea in Pump design. It differs radically in construction, principle of operation and character of performance from all other known types of pumping machinery. In recognition, broad basic patents have been granted in all civilized countries.

The WESTCO Pump has but *one moving part*—the impeller. This is a wheel containing a certain determined number of recessed pockets on each side of its outer rim. Rotating at high velocity in a water channel machined in the pump casting, it draws the water by powerful suction from the source of supply and discharges it against pressure at the outlet. The WESTCO has accomplished what engineers have long hoped for, but thought never could be done—it combines the extreme simplicity and large capacity of a centrifugal pump with the positive action and high pressure possibilities of a plunger pump.

The WESTCO has nothing even remotely resembling a valve in its make-up. It has no gears, no springs, no "dead centre," and no eccentric impeller motion with consequent pulsation of delivery.

CONSTRUCTION.

WESTCO Pumps are designed to operate at standard motor speeds from 1200 to 1800 R.P.M. On special work they are successfully operating up to 4000 R.P.M. turbine driven. Our standard construction in all sizes includes bronze impeller, Monel Metal shaft, bronze or cast iron casing and S.K.F. Ball thrust bearings outboard—the *highest grade construction in any pumping machinery on the market.*

Westco TANKLESS WATER SYSTEM.

The WESTCO Pump makes possible a successful, reliable TANKLESS AUTOMATIC WATER SYSTEM. Its *ONE* moving part, the IMPELLER, reduces the possibilities for wear and the development of trouble to a minimum. Its large capacity and noiseless, vibrationless action and absolutely pulsationless flow make the use of a pneumatic storage tank, except in large sizes and special circumstances, an entirely unnecessary and wasteful expense.

The WESTCO TANKLESS AUTOMATIC SYSTEM delivers water to every part of the house, barn, garage and grounds, with full, continuous flow at high pressure, and *absolutely fresh*, direct from your well or cistern to the tap. Simply the opening of a faucet anywhere in the service line starts the pump. Close the faucet and within a few seconds the pump stops. There is no power wasted pumping for long periods into a storage tank to build up a pressure far in excess of normal service requirements.

SIZE AND SPECIFICATIONS.

TANKLESS SYSTEMS are made in $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 H.P. sizes, ranging in capacities from 300 to 1000 gallons hour. Each System includes a standard bronze ball-bearing WESTCO Pump, direct connected to a high grade motor and controlled by a WESTCO TWO-POLE electric pressure switch of OUR OWN DESIGN and MAKE, completely assembled and tested ready for service *without the need of special adjustments at the time of installation.*

GUARANTEE.

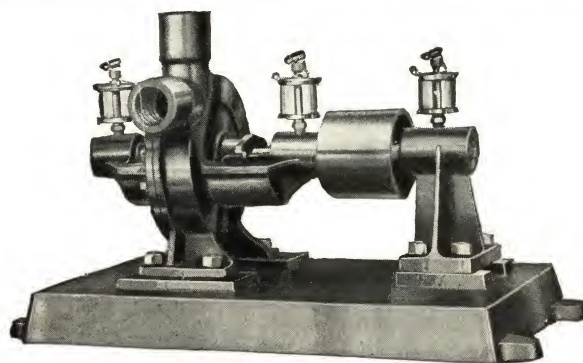
THESE SYSTEMS TOGETHER WITH ALL WESTCO PUMPS ARE SOLD UNDER AN UN-CONDITIONAL AND IRON-BOUND GUARANTEE.

Westco PNEUMATIC TANK SYSTEMS.

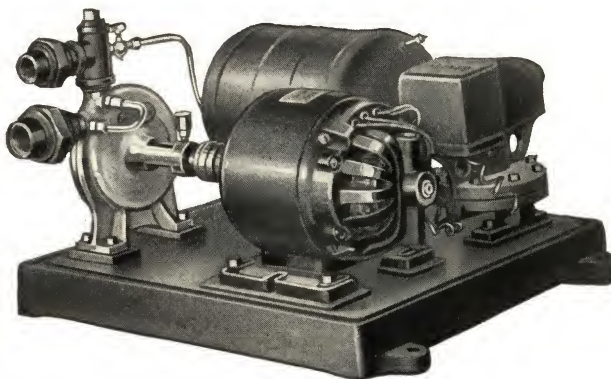
WESTCO PNEUMATIC TANK SYSTEMS are recommended for larger installations such as in Schools, Public Institutions, Golf Courses, Factories, etc., or in villages where power is available only during certain hours. These Systems can be furnished with pumps of capacity up to 10,000 gals. per hour and with tanks of any size required.

SERVICE.

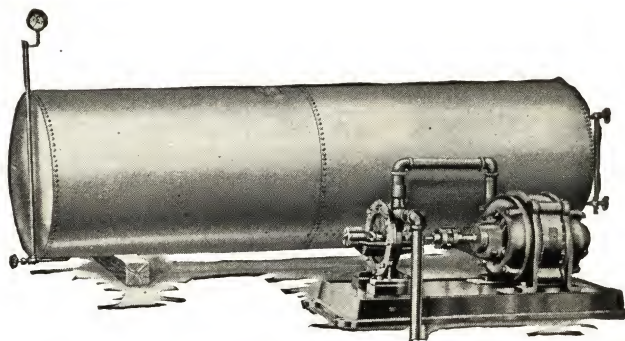
We are constantly finding new applications and uses for our pump. Large numbers are in successful service on CONDENSATION Return Units, Oil-Burning Equipment, boosting pressure in high buildings, and pumping sewage, paper pulp, chemicals, molasses, in fact anything liquid. If you have pump requirements of any description, let us help you to meet them. We are always glad to make up special equipment to meet unusual or new requirements. Our engineers and our factory are at your service to help you solve your pumping problems. Full particulars and literature will be mailed on request.



A Belt-Driven Westco, designed for use where electricity is not available, or where power is generated from some other source. Fast and loose pulleys for all models furnished if desired.



No. 4 WESTCO Tankless System with $\frac{1}{4}$ H.P. Motor. Recommended for installation to meet the requirements of the average home Capacity 300 gallons per hour.



Westco Pneumatic Tank Water System, supplied complete, including tank, pumping outfit, automatic pressure regulating switch, water and pressure gauges and pipe connections at pump.

THE McCLARY MANUFACTURING COMPANY

HEAD OFFICES AND FACTORIES AT LONDON, ONT.

DISTRIBUTING WAREHOUSES: LONDON, ONT., TORONTO, ONT., MONTREAL, QUE., WINNIPEG, MAN.,
VANCOUVER, B.C., ST. JOHN, N.B., HAMILTON, ONT., CALGARY, ALTA.,
SASKATOON, SASK., EDMONTON, ALTA.

ELECTRIC RANGES.

FOR HOMES AND APARTMENT HOUSES.

One Broiling and Baking Oven, with two Elements. One Warming Closet complete with Element. Cooking Surface with two 9" elements and two 6" elements. Heating capacities as follows:—



No. 518 E.S.

OVEN—Broiling Element.....1250 Watts.
LOWER Element.....1250 Watts.
WARMING CLOSET Element.....600 Watts.
9" SURFACE Elements.....1400 Watts.
6" SURFACE Elements.....850 Watts.

PROTECTED ELEMENTS.—An exclusive feature—Coils protected from oxidization by a special formula cement mixture, also proof against carelessness and ignorance. Heats as rapidly as ordinary types and holds the heat longer.

OVEN.—Seamless welded and enamelled. Round cornered and washable. Without cracks, joints or crevices; fumes or liquids cannot permeate insulation. Conceded by experts this perfect sanitary construction stands far superior to any other electric Oven manufactured.

OVEN INSULATION— $1\frac{3}{4}$ " mineral wool between outer and inner bodies of oven—Magnesia block $1\frac{1}{2}$ " thick in the door—thus practically operates on fireless cooker principle.

OVEN ELEMENTS—Highest grade resistance wire, porcelain supported throughout—no mica construction.

CLEANING—Racks swing on pivots, rack holders removable—interior surface is therefore clear for cleaning purposes.

OVEN TERMINAL—Monel wire insulated with porcelain beads, eliminating corrosion from acids and fumes, also not effected by intense heat of oven.

PILOT LAMPS—Indicate whether current is on or off oven.

HOUSE WIRING—The Range is adapted for 3 wire 110-220 volt system. Also suitable for alternating or direct, current 110 volt if specified.

RANGE CONNECTION—Slate terminal block for main connections placed where easily accessible through outside. Sliding panel. Provision made for entrance to body of Range by either conduit or porcelain bushings. Neutral wire throughout has red colored insulation to distinguish. When range is required to be moved disconnection is made by disconnecting slate terminal block—no soldered joints to tamper with.

NOTE: If two wires used, please specify, as change in wiring is necessary—this adjustment made without additional cost.

PANEL CONSTRUCTION—Fuse block and switches mounted on separate panel unit. By removal of four bolts switches available for inspection and repairs.

SURFACE ELEMENTS—Held in position by centre bolt upon removal of which elements can be lifted up for inspection and repairs.

THERMOMETERS—Mercury or Compensating Thermometers—both efficient. Former supplied at extra charge.

SWITCHES—Marked with number corresponding to element.

BODY—Front and Cooking Top Cast-iron. Remainder of Body Armco Iron, black japanned.

White Enamelled Broiling Pan. Three heat standard switches. Maximum capacity 68 amperes. Size of Oven 18 x 18 x 15 inches.

ONE REGISTER (PIPELESS) FURNACE.

MAIN FABRIC—Weighty refined cast-iron with close grained surface. Careful distribution of iron ensures extra thickness at vital parts. Exceptional resistance to sulphur fumes and gases. Parts carefully assembled—dust and gas tight construction. All cast-iron—no steel.

FIREPOT—In two pieces with famous cup joints. Sides almost perpendicular prevent dead ashes accumulating—assures freer distribution of heat.

DOVE AND RADIATOR—Each cast in one piece guarantees a solid construction. Carries heat units in long travel. Radiator easy to clean through large clean out door.

ASH PIT—Roomy, gives clear space for passage of air upwards—creates brighter fire and better draft control. Ash Pan of Steel fitted with two bail handles.

FEED DOOR—Spacious door simplifies firing with coal and large chunks of wood.

AIR DRAFT—Special construction for soft coal use, carries from outside through air blast ring into interior a current of air which is heated in its passage and in its heated state is forced through small holes around firepot and flows over the top of the live coals, igniting the gasses arising therefrom.

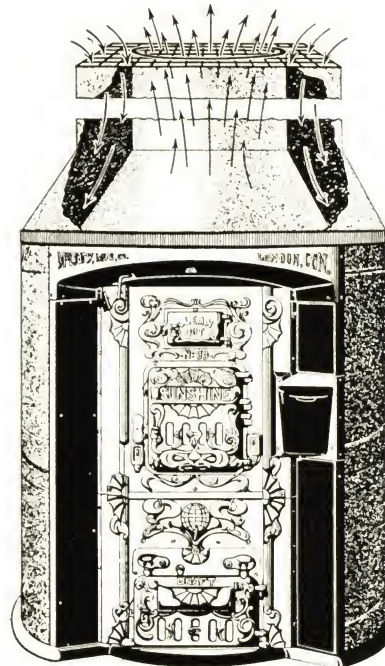
DUST FLUE—Carries the dust from ash pit to chimney and prevents it escaping into basement or rooms above.

REGISTER—One large register combines warm air outlet and cool air inlet. Black japanned—attractive. Will resist weight of 1,500 lbs.

WATER PAN—At correct height for refilling with ease. Its moisture humidifies the warmed air passing upwards and makes it healthy and invigorating.

GRATES—In four pieces—each piece three sided. Crush clinkers with ease. The Sofco Sunshine will last a lifetime adapted for burning hard and soft coal, coke, wood, lignite and any other combustible fuel which may be available locally.

Equipped with Poker, Shovel and regulating chains for operating drafts from room above.



SOFCO SUNSHINE ONE-REGISTER (PIPELESS) SYSTEM.

No.	DIAM. OF FIREPOT	SMOKE PIPE	CAPACITY IN CUBIC FEET	SHIPPING WEIGHT
91	19"	8"	15,000	1,075 lbs.
93	21 $\frac{1}{2}$ "	9"	25,000	1,400 "

See also our Advertisement pages 136-137.

WARDEN KING, LIMITED

MADE IN CANADA.

EXECUTIVE OFFICES AND WORKS:
 BENNETT AVE., MAISONNEUVE,
 MONTREAL, QUE.

TORONTO BRANCH:
 136 SIMCOE STREET.

SALES OFFICE AND CITY WAREHOUSE:
 151 CRAIG STREET WEST,
 MONTREAL, QUE.

PRODUCTS.

CAST IRON FLANGED FITTINGS (STANDARD AND EXTRA HEAVY), CAST IRON SOIL PIPE (STANDARD AND EXTRA HEAVY), CAST IRON CESSPOOLS, STABLE GUTTERS, SINK TRAPS, WHEEL GUARDS, MANHOLE COVERS, Etc., Etc.

CAST IRON FLANGED FITTINGS.

STANDARD AND EXTRA HEAVY.

Standard for working pressure up to 125 lbs. Extra Heavy for working pressure up to 250 lbs.



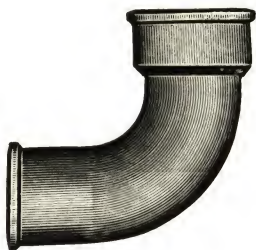
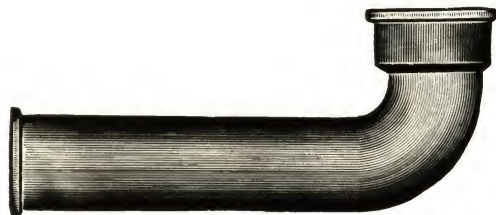
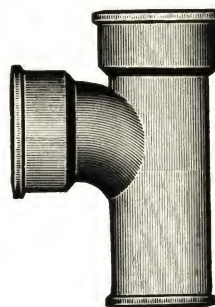
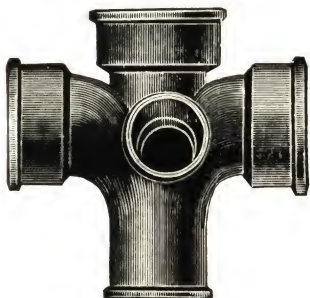
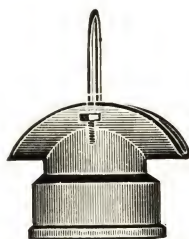
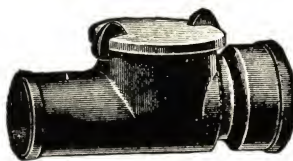
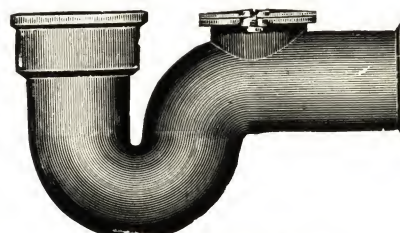
ELBOW WITH BASE.

STRAIGHT TEE.

REDUCING TEE.
ALL SIZES FROM 1 1/4" to 24" DIAMETER.

BRANCH.

ELBOW, 90°.

CAST IRON SOIL PIPE AND FITTINGS.
MEDIUM AND EXTRA HEAVY.SINGLE HUB PIPE, FLAT BEAD.
Sizes from 2" to 8" diameter.DOUBLE HUB PIPE, FLAT BEAD.
Sizes from 2" to 8" diameter.QUARTER BENDS.
Sizes from 2" to 8" diameter.LONG QUARTER BENDS.
4" diameter, 10" to 36" in the clear."TY" BRANCHES.
Sizes from 2" x 2" to 8" x 8"DOUBLE "TY" BRANCHES.
4" only, with 2" side outlet.TRAP SCREW FERRULES
WITH IRON BODY AND
BRASS COVERS.
Sizes 2" to 8" diameter.DOUBLE HUBS.
Sizes from 2" to 8"
diameter.CONOLLY SADDLE HUBS.
Sizes from 2" x 2" to 6" x 4"PALMER BACK WATER TRAP.
Sizes from 3" to 8" diameter.HALF "S" or "P" TRAPS, WITH
HANDHOLE AND COVER.
Sizes from 2" to 8" diameter.

CONTINUED ON NEXT PAGE

WARDEN KING, LIMITED

MADE IN CANADA.

EXECUTIVE OFFICES AND WORKS:
BENNETT AVE., MAISONNEUVE,
MONTREAL, QUE.

TORONTO BRANCH:
136 SIMCOE STREET.

SALES OFFICE AND CITY WAREHOUSE:
151 CRAIG STREET WEST,
MONTREAL, QUE.

PRODUCTS.

"DAISY" BOILER.

The "DAISY" BOILER is over thirty years old, and there are over 60,000 in use.

The "Daisy" Boiler of to-day is constructed practically on the same lines as those first put out in 1885. It is manufactured in the largest and best equipped plant in Canada, and the best material is used in every part of it. Its durability is proved by the fact that many of those which were first placed in operation are still giving perfect satisfaction.

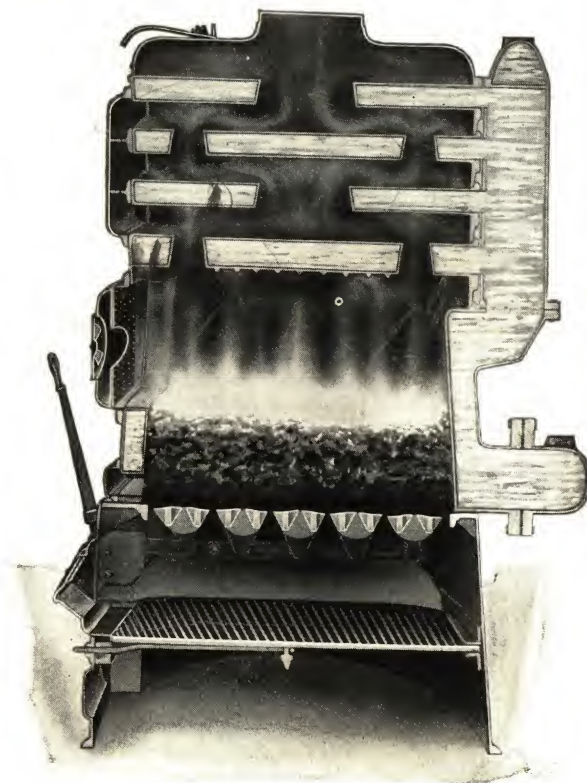
The "Daisy" is easy to clean and easy to operate.



FIG. A.



FIG. B.



FIRE-POT.

The Fire-Pot (Fig. B) is deep and all gases are consumed in the combustion chambers, consequently a high temperature of water is maintained on minimum fuel consumption. On the inside of the fire-pot are vertical ribs to permit the air to rise freely through the coal at the outside edges of the fire, keeping it burning evenly and preventing the accumulation of ashes near the water in fire-pot.

FIRST SECTION.

The First Section of the "Daisy" (Fig. A) is directly over the fire-pot, and receives at right angles direct currents of gases of the most intense heat. In order to absorb all the heat possible we have increased the water capacity of this section, enlarged the waterways and cast raised rings on the under side, thereby increasing the heating surface and retarding the flames of the gases until the water has absorbed the greatest possible amount of heat.

WATER-POST.

The Water-Post is the connecting passage between the different water sections of the boiler, and possesses exclusive features. Its interior is divided by a partition, which separates the flow and return openings. The water rising from the fire-pot enters one side of this casting and passes into the large openings of each section simultaneously, thus insuring positive and continuous circulation. The "Daisy" water-post admits of one or more sections being shut off, the use of the others being continued, so that *in case of accident any of the sections may be detached and replaced without disturbing the piping.*

MADE IN CANADA.

COMBUSTION
CHAMBER
AND FLUES.

The Combustion Chamber and Flues are so proportioned and arranged that the combustion of the gases commencing in the fire-pot is completed before they escape to the chimney.

NOTE.

When desired, two or more "Daisy" Boilers may be connected in series, and under this arrangement they may be used singly or together.

CAPACITIES, DIMENSIONS AND PRICES.

Boiler Number.	Price.	Gross Rating.	Net Rating.	Height to Top of Headers in Inches.	Diameter of Smoke Pipe in Inches.	Diameter of Base Ring in Inches.	Diameter of Fire Pot Bottom in Inches.	Depth of Fire Pot in Inches.	No and Size of Mains Flow and Return in Inches.	Size of Expansion Pipe in Inches.	Shipping Weight.
	Low Base.	Square Feet.	Square Feet.	Low Base.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Low Base.
0	\$ 226.00	300	200	46 $\frac{1}{2}$	7	27	17 $\frac{1}{2}$	15 $\frac{3}{4}$	4-2	1	760
1	268.00	375	250	50 $\frac{1}{2}$	7	27	17 $\frac{1}{2}$	15	4-2	1	830
1 $\frac{1}{2}$	287.00	450	300	53 $\frac{1}{2}$	7	27	17 $\frac{1}{2}$	15	4-2	1	900
2	320.00	550	365	52	7	31	20 $\frac{1}{2}$	16	4-2	1	1,100
2 $\frac{1}{2}$	356.00	625	420	54 $\frac{1}{2}$	7	31	20 $\frac{1}{2}$	16	4-2	1	1,225
3	382.00	750	500	52 $\frac{1}{2}$	8	34 $\frac{1}{2}$	21 $\frac{1}{2}$	16 $\frac{1}{2}$	4-2	1	1,300
3 $\frac{1}{2}$	425.00	875	585	55 $\frac{1}{2}$	8	34 $\frac{1}{2}$	21 $\frac{1}{2}$	16 $\frac{1}{2}$	4-2	1	1,435
4	462.00	1,025	685	55 $\frac{1}{2}$	8	36 $\frac{1}{2}$	24	16 $\frac{1}{2}$	4-2	1	1,600
4 $\frac{1}{2}$	498.00	1,125	750	58 $\frac{1}{2}$	8	36 $\frac{1}{2}$	24	16 $\frac{1}{2}$	4-2	1	1,765
5	550.00	1,250	835	56 $\frac{1}{2}$	10	39	26 $\frac{1}{2}$	16 $\frac{1}{2}$	6-2	1	1,945
5 $\frac{1}{2}$	590.00	1,400	935	60 $\frac{1}{2}$	10	39	26 $\frac{1}{2}$	16 $\frac{1}{2}$	6-2	1	2,160
6	654.00	1,500	1,000	58 $\frac{1}{2}$	10	41 $\frac{1}{2}$	28 $\frac{1}{2}$	17 $\frac{1}{2}$	7-2	1	2,350
6A	706.00	1,650	1,100	62 $\frac{1}{2}$	10	41 $\frac{1}{2}$	28 $\frac{1}{2}$	17 $\frac{1}{2}$	7-2	1	2,615
6 $\frac{1}{2}$	775.00	1,875	1,250	62 $\frac{1}{2}$	10	42 $\frac{1}{2}$	31 $\frac{1}{2}$	17 $\frac{1}{2}$	6-2-2-2 $\frac{1}{2}$	1	2,560
6 $\frac{1}{2}$ A	840.00	2,025	1,350	69 $\frac{1}{2}$	10	42 $\frac{1}{2}$	31 $\frac{1}{2}$	17 $\frac{1}{2}$	6-2-2-2 $\frac{1}{2}$	1	2,860
7	880.00	2,250	1,500	65 $\frac{1}{2}$	12	45	34	18	9-2-2-2 $\frac{1}{2}$	1	2,990
7 $\frac{1}{2}$	945.00	2,650	1,765	72 $\frac{1}{2}$	12	45	34	18	9-2-2-2 $\frac{1}{2}$	1	3,330
8	1,052.00	3,000	2,000	66 $\frac{1}{2}$	12	50 $\frac{1}{2}$	39	18 $\frac{1}{2}$	11-2-2-2 $\frac{1}{2}$	1	3,800
8 $\frac{1}{2}$	1,210.00	3,450	2,300	73 $\frac{1}{2}$	12	50 $\frac{1}{2}$	39	18 $\frac{1}{2}$	11-2-2-2 $\frac{1}{2}$	1	4,250
9	1,300.00	4,000	2,665	69	12	52 $\frac{1}{2}$	41 $\frac{1}{2}$	18 $\frac{1}{2}$	11-2-2-2 $\frac{1}{2}$	1	4,400
9 $\frac{1}{2}$	1,500.00	4,500	3,000	77 $\frac{1}{2}$	12	52 $\frac{1}{2}$	41 $\frac{1}{2}$	18 $\frac{1}{2}$	11-2-2-2 $\frac{1}{2}$	1	4,950
10	2,200.00	6,000	4,000	Special	12	Special	Special	Special	Special	2	7,275

"VIKING" BOILERS FOR STEAM AND HOT WATER.

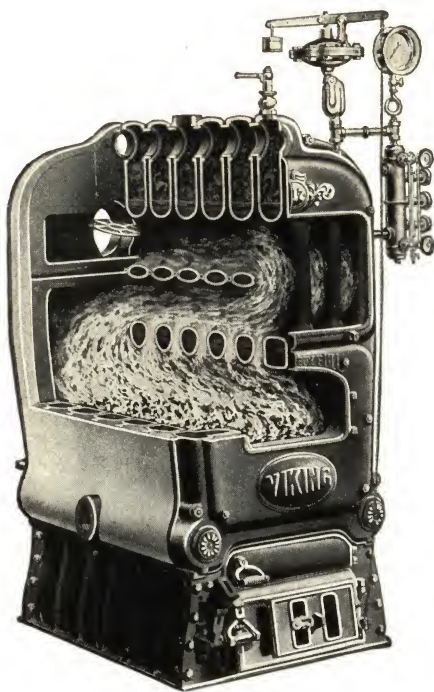


FIG. A.



FIG. B.

"VIKING"
BOILERS.

"Viking" Boilers, for steam and hot water, are noted for their prompt response to a quickened fire. Note the ample height of the combustion chamber above the fire, also the extent and arrangement of the interior surfaces to insure the maximum fuel heat being absorbed.

"Viking" Boilers are especially designed for deep, slowly-burning fires, fourteen to sixteen inches thick and more, consequently an effective fire is easily maintained all night or during the day with the least possible attention; coal burns slowly and completely, without clinkers and with greatest economy. All our fire-boxes are proportioned for moderate consumption.

REGULATOR.

An improved sensitive diaphragm Regulator (Fig. A) is furnished with all steam "Vikings." The diaphragm is unusually large and responds quickly to the slightest change of boiler pressure, opening draft and damper when the pressure falls and closing them when it rises. The pressure to be carried is regulated by the counterweight. With adequate draft and fuel and when connected with our improved balance check-damper (Fig. B), this regulator will automatically control and maintain steam pressure.

CONSTRUCTION. Sections are accurately reamed, connected by tapered push-nipples, then drawn together and held permanently in place by iron bolts.

HYDROSTATIC TEST. 75 lbs. per square inch.

ADVANTAGES. Easy to operate.

Easy to clean.

Honestly made.

Hard Coal, Soft Coal, Coke or Wood may be used.

Made in four series comprising twenty-seven regular sizes.

The "Viking" water-line area is about 50 per cent. in excess of its grate area—result, "Dry Steam."

We would specially draw your attention to the large Steam Dome above water line, ensuring a steady and ample supply of steam.

RATINGS.

Dimensions, Capacities, Prices, etc. The following ratings are gross and include mains, risers and branches.

Series and Number	Measurements of Fire Box at Top in inches	Fire Area and diameter of equivalent round grate		Principal Dimensions in Inches			Size of Smoke Outlet	Steam				Hot Water			
		Square Inches	Equivalent round grate	Height	Width	Length		Regular Tappings flow and return	Gross Capacity Square Ft.	Height of Water Line	List Price	Regular Tappings flow and return	Gross Capacity Square Ft.	Size of Expansion Pipe	List Price
15-4	17 x 18	306	19 $\frac{3}{4}$	57	28	31	7 ins.	1-4 in.	300	48 ins.	\$215.00	1-4 in.	500	1 in.	\$190.00
5	17 x 24	408	22 $\frac{3}{4}$	57	28	37	7 ins.	1-4 in.	425	48 ins.	255.00	1-4 in.	700	1 in.	230.00
6	17 x 30	510	25 $\frac{1}{2}$	57	28	43	7 ins.	2-4 in.	550	48 ins.	295.00	2-4 in.	900	1 in.	270.00
7	17 x 36	612	27 $\frac{3}{4}$	57	28	49	7 ins.	2-4 in.	675	48 ins.	337.50	2-4 in.	1100	1 in.	312.50
20-4	22 x 18	396	22 $\frac{1}{2}$	65	33	31	9 ins.	2-4 in.	500	55 ins.	275.00	2-4 in.	825	1 $\frac{1}{4}$ in.	250.00
5	22 x 24	528	26	65	33	37	9 ins.	2-4 in.	600	55 ins.	312.50	2-4 in.	1000	1 $\frac{1}{4}$ in.	287.50
6	22 x 30	660	29	65	33	43	9 ins.	2-4 in.	800	55 ins.	375.00	2-4 in.	1325	1 $\frac{1}{4}$ in.	350.00
7	22 x 36	792	31 $\frac{1}{2}$	65	33	49	9 ins.	2-4 in.	1000	55 ins.	425.00	2-4 in.	1650	1 $\frac{1}{4}$ in.	400.00
8	22 x 42	924	34 $\frac{1}{2}$	65	33	55	9 ins.	2-4 in.	1200	55 ins.	475.00	3-4 in.	2000	1 $\frac{1}{4}$ in.	450.00
9	22 x 48	1056	36 $\frac{3}{4}$	65	33	61	9 ins.	2-4 in.	1400	55 ins.	525.00	3-4 in.	2300	1 $\frac{1}{4}$ in.	500.00
10	22 x 54	1148	38 $\frac{1}{4}$	65	33	67	9 ins.	2-4 in.	1600	55 ins.	575.00	3-4 in.	2600	1 $\frac{1}{4}$ in.	550.00
11	22 x 60	1320	41	65	33	73	9 ins.	2-4 in.	1800	55 ins.	625.00	3-4 in.	2900	1 $\frac{1}{2}$ in.	600.00
30-5	32 x 24	768	31 $\frac{1}{2}$	70	43	37	14 ins.	2-4 in.	1000	57 ins.	425.00	2-4 in.	1650	1 $\frac{1}{2}$ in.	400.00
6	32 x 30	960	35	70	43	43	14 ins.	2-4 in.	1350	57 ins.	512.50	2-4 in.	2250	1 $\frac{1}{2}$ in.	487.50
7	32 x 36	1152	38 $\frac{3}{4}$	70	43	49	14 ins.	3-4 in.	1700	57 ins.	600.00	3-4 in.	2800	1 $\frac{1}{2}$ in.	575.00
8	32 x 42	1344	41 $\frac{3}{8}$	70	43	55	14 ins.	3-4 in.	2100	57 ins.	700.00	3-4 in.	3400	1 $\frac{1}{2}$ in.	675.00
9	32 x 48	1536	44 $\frac{1}{4}$	70	43	61	14 ins.	3-4 in.	2400	57 ins.	775.00	4-4 in.	4000	1 $\frac{1}{2}$ in.	750.00
10	32 x 54	1728	46 $\frac{3}{8}$	70	43	67	14 ins.	3-4 in.	2700	57 ins.	850.00	4-4 in.	4500	1 $\frac{1}{2}$ in.	825.00
11	32 x 60	1920	49 $\frac{1}{2}$	70	43	73	14 ins.	4-4 in.	3000	57 ins.	925.00	4-4 in.	5000	1 $\frac{1}{2}$ in.	900.00
12	32 x 66	2112	51 $\frac{1}{4}$	70	43	79	14 ins.	4-4 in.	3300	57 ins.	1000.00	4-4 in.	5500	1 $\frac{1}{2}$ in.	975.00
13	32 x 72	2304	54 $\frac{1}{8}$	70	43	85	14 ins.	4-4 in.	3600	57 ins.	1075.00	4-4 in.	6000	1 $\frac{1}{2}$ in.	1050.00
40-5	42 x 32	1344	41 $\frac{3}{8}$	80	53	40	18 ins.	1-6 in.	2100	64 $\frac{1}{2}$ ins.	700.00	1-6 in.	3500	2 in.	687.50
6	42 x 40	1680	46 $\frac{1}{4}$	80	53	48	18 ins.	1-6 in.	2600	64 $\frac{1}{2}$ ins.	825.00	2-6 in.	4400	2 in.	787.50
7	42 x 48	2016	50 $\frac{3}{8}$	80	53	56	18 ins.	1-6 in.	3100	64 $\frac{1}{2}$ ins.	950.00	2-6 in.	5400	2 in.	912.50
8	42 x 56	2352	54 $\frac{3}{4}$	80	53	64	18 ins.	2-6 in.	3700	64 $\frac{1}{2}$ ins.	1100.00	2-6 in.	6400	2 in.	1062.50
9	42 x 64	2688	58 $\frac{1}{2}$	80	53	72	18 ins.	2-6 in.	4300	64 $\frac{1}{2}$ ins.	1250.00	2-6 in.	7425	2 in.	1212.50
10	42 x 72	3024	62	80	53	80	18 ins.	2-6 in.	4950	64 $\frac{1}{2}$ ins.	1412.50	3-6 in.	8550	2 in.	1375.00
11	42 x 80	3360	65	80	53	88	18 ins.	2-6 in.	5550	64 $\frac{1}{2}$ ins.	1637.50	3-6 in.	9675	2 in.	1600.00
12	42 x 88	3696	68 $\frac{1}{4}$	80	53	96	18 ins.	2-6 in.	6550	64 $\frac{1}{2}$ ins.	1812.50	3-6 in.	10800	2 in.	1775.00
13	42 x 96	4032	72	80	53	104	18 ins.	2-6 in.	7250	64 $\frac{1}{2}$ ins.	1975.00	4-6 in.	11925	2 in.	1925.00

"VIKING" RADIATORS.

MADE IN CANADA.



TWO COLUMN.

THREE COLUMN.

FOUR COLUMN.

HEATING SURFACE.

Number of Sections.	*Length 2 1/2 in. per Section.	45 in. in Height.		38 in. in Height.		32 in. in Height.		30 in. in Height.		26 in. in Height.		23 in. in Height.		20 in. in Height.	
		5 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	4 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	3 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	3 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	2 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	2 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.
2	5	10	30	8	24	6 1/2	20	6	18	5 1/2	16	4 1/2	14	4	12
3	7 1/2	15	45	12	36	10	30	9	27	8 1/2	24	7	21	6	18
4	10	20	60	16	48	13 1/2	40	12	36	11 1/2	32	9 1/2	28	8	24
5	12 1/2	25	75	20	60	16 1/2	50	15	45	14 1/2	40	11 1/2	35	10	30
6	15	30	90	24	72	20	60	18	54	18 1/2	48	14 1/2	42	12	36
7	17 1/2	35	105	28	84	23 1/2	70	21	63	21 1/2	56	16 1/2	48	14	42
8	20	40	120	32	96	26 1/2	80	24	72	24 1/2	64	18 1/2	56	16	48
9	22 1/2	45	135	36	108	30	90	27	81	27 1/2	72	20 1/2	63	18	54
10	25	50	150	40	120	33 1/2	100	30	90	30 1/2	80	23 1/2	70	20	60
11	27 1/2	55	165	44	132	36 1/2	110	33	99	33 1/2	88	25 1/2	77	22	66
12	30	60	180	48	144	40	120	36	108	36 1/2	96	28 1/2	84	24	72
13	32 1/2	65	195	52	156	43 1/2	130	39	117	39 1/2	104	30 1/2	91	26	78
14	35	70	210	56	168	46 1/2	140	42	126	42 1/2	112	32 1/2	98	28	84
15	37 1/2	75	225	60	180	50	150	45	135	45 1/2	120	35 1/2	105	30	90
16	40	80	240	64	192	53 1/2	160	48	144	48 1/2	128	37 1/2	112	32	96
17	42 1/2	85	255	68	204	56 1/2	170	51	153	51 1/2	136	39 1/2	119	34	102
18	45	90	270	72	216	60	180	54	162	54 1/2	144	42 1/2	126	36	108
19	47 1/2	95	285	76	228	63 1/2	190	57	171	57 1/2	152	44 1/2	133	38	114
20	50	100	300	80	240	66 1/2	200	60	180	60 1/2	160	46 1/2	140	40	120
21	52 1/2	105	315	84	252	70	210	63	189	63 1/2	168	49 1/2	147	42	126
22	55	110	330	88	264	73 1/2	220	66	198	66 1/2	176	51 1/2	154	44	132
23	57 1/2	115	345	92	276	76 1/2	230	69	207	69 1/2	184	53 1/2	161	46	138
24	60	120	360	96	288	80	240	72	216	72 1/2	192	56 1/2	168	48	144
25	62 1/2	125	375	100	300	83 1/2	250	75	225	75 1/2	200	58 1/2	175	50	150
Price per Sq. Ft.	Water	1.00	...	1.00	...	1.10	...	1.15	...	1.20	...	1.26	...	1.36	...
	Steam	...	...	...	...	...	...	...	...	...	...	...	...	...	...

HEATING SURFACE.

Number of Sections.	*Length 2 1/2 in. per Section.	44 in. in Height.		38 in. in Height.		32 in. in Height.		26 in. in Height.		22 in. in Height.		18 in. in Height.	
		6 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	5 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	4 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	3 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	3 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	2 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.
2	5	12	36	10	30	9	27	7	21	6	18	4	12
3	7 1/2	18	54	15	45	13 1/2	40	11 1/2	33	9	27	6 1/2	19 1/2
4	10	24	72	20	60	18	54	15 1/2	45	12	36	9	27
5	12 1/2	30	90	25	75	22 1/2	67 1/2	18 1/2	56 1/2	15 1/2	45	11 1/2	33 1/2
6	15	36	108	30	90	27	81	22 1/2	67 1/2	18 1/2	54	13 1/2	40 1/2
7	17 1/2	42	126	35	105	31 1/2	94 1/2	26 1/2	78 1/2	21 1/2	63	15 1/2	47 1/2
8	20	48	144	40	120	36	108	30	90	24 1/2	72	18 1/2	54 1/2
9	22 1/2	54	162	45	135	40 1/2	121 1/2	33 1/2	101 1/2	27 1/2	81	20 1/2	60 1/2
10	25	60	180	50	150	45	135	37 1/2	112 1/2	30	90	22 1/2	67 1/2
11	27 1/2	66	198	55	165	49 1/2	148 1/2	41 1/2	123 1/2	33 1/2	99	24 1/2	74 1/2
12	30	72	216	60	180	54	162	45 1/2	135 1/2	36 1/2	108	27 1/2	81 1/2
13	32 1/2	78	234	65	195	58 1/2	175 1/2	48 1/2	146 1/2	39 1/2	117	29 1/2	87 1/2
14	35	84	252	70	210	63	189	52 1/2	157 1/2	42 1/2	126	31 1/2	94 1/2
15	37 1/2	90	270	75	225	67 1/2	202 1/2	56 1/2	168 1/2	45 1/2	135	33 1/2	101 1/2
16	40	96	288	80	240	72	216	60 1/2	180 1/2	48 1/2	144	36 1/2	108 1/2
17	42 1/2	102	306	85	255	76 1/2	229 1/2	63 1/2	191 1/2	51 1/2	153	38 1/2	114 1/2
18	45	108	324	90	270	81	243	67 1/2	202 1/2	54 1/2	162	40 1/2	121 1/2
19	47 1/2	114	342	95	285	85 1/2	256 1/2	71 1/2	213 1/2	57 1/2	171	42 1/2	128 1/2
20	50	120	360	100	300	90	270	75 1/2	225 1/2	60 1/2	180	45 1/2	135 1/2
21	52 1/2	126	378	105	315	94 1/2	283 1/2	78 1/2	236 1/2	63 1/2	189	47 1/2	141 1/2
22	55	132	396	110	330	99	297	82 1/2	247 1/2	66 1/2	198	49 1/2	148 1/2
23	57 1/2	138	414	115	345	103 1/2	310 1/2	86 1/2	258 1/2	69 1/2	207	51 1/2	155 1/2
24	60	144	432	120	360	108	324	90 1/2	270 1/2	72 1/2	216	54 1/2	162 1/2
25	62 1/2	150	450	125	375	112 1/2	337 1/2	93 1/2	281 1/2	75 1/2	225	56 1/2	168 1/2
Price per Sq. Ft.	Water	1.00	...	1.00	...	1.10	...	1.20	...	1.30	...	1.40	...
	Steam	...	...	...	...	...	...	...	...	...	...	...	...

HEATING SURFACE.

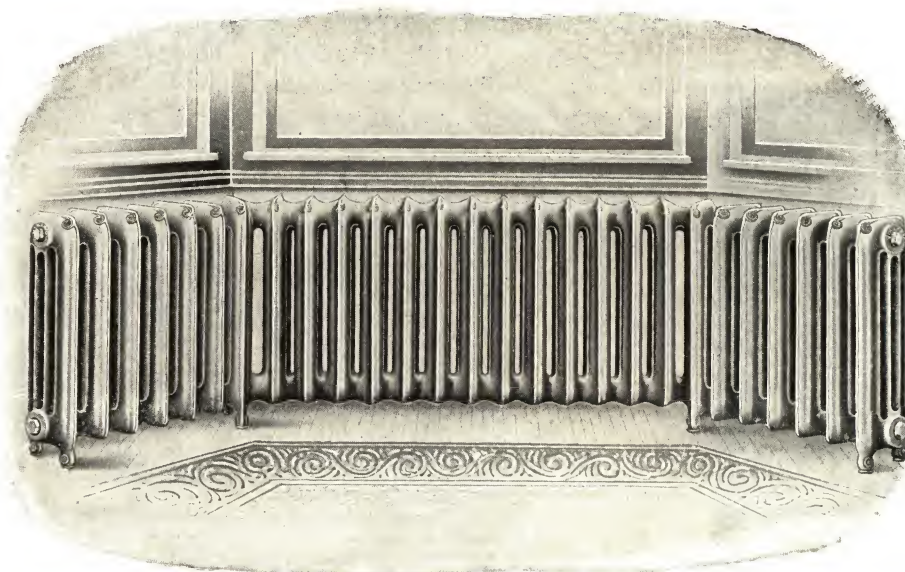
Number of Sections.	*Length 4 1/2 in. per Section.	42 in. in Height.		38 in. in Height.		32 in. in Height.		26 in. in Height.		20 in. in Height.		16 in. in Height.	
		9 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	8 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	6 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	5 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	4 Sq. Ft. per Section.	Equivalent 1 in. Pipe.	2 1/2 Sq. Ft. per Section.	Equivalent 1 in. Pipe.
2	8 1/2	19 1/2	58	16	48	13 1/2	40	10 1/2	32	8	24	5	15
3	12 1/2	29 1/2	87	24	72	20 1/2	60	16 1/2	48	12 1/2	36	7 1/2	22 1/2
4	16 1/2	38 1/2	116	32	96	26 1/2	80	21 1/2	64	16 1/2	48	10 1/2	30 1/2
5	20 1/2	48 1/2	145	40	120	33 1/2	100	26 1/2	80	20 1/2	60	12 1/2	37 1/2
6	24 1/2	58 1/2	174	48	144	40 1/2	120	32 1/2	96	24 1/2	72	15 1/2	45 1/2
7	28 1/2	67 1/2	203	56	168	46 1/2	140	37 1/2	112	28 1/2	84	17 1/2	52 1/2
8	32 1/2	77 1/2	232	64	192	53 1/2	160	42 1/2	128	32 1/2	96	20 1/2	60 1/2
9	37 1/2	87 1/2	261	72	216	60 1/2	180	48 1/2	144	36 1/2	108	22 1/2	67 1/2
10	41 1/2	96 1/2	290	80	240	66 1/2	200	53 1/2	160	40 1/2	120	25 1/2	75 1/2
11	45 1/2	106 1/2	319	88	264	73 1/2	220	58 1/2	176	44 1/2	132	27 1/2	82 1/2
12	49 1/2	116 1/2	348	96	288	80 1/2	240	64 1/2	192	48 1/2	144	30 1/2	90 1/2
13	53 1/2	125 1/2	377	104	312	86 1/2	260	69 1/2	208	52 1/2	156	32 1/2	97 1/2
14	57 1/2	135 1/2	406	112	336	93 1/2	280	74 1/2	224	56 1/2	168	35 1/2	105 1/2
15	61 1/2	145 1/2	435	120	360	100 1/2	300	80 1/2	240	60 1/2	180	37 1/2	112 1/2
16	65 1/2	154 1/2	464	128	384	106 1/2	320	85 1/2	256	64 1/2	192	40 1/2	120 1/2
17	70 1/2	164 1/2	493	136	408	113 1/2	340	90 1/2	272	68 1/2	204	42 1/2	127 1/2
18	74 1/2	174 1/2	522	144	432	120 1/2	360	96 1/2	288	72 1/2	216	45 1/2	135 1/2
19	78 1/2	183 1/2	551	152	456	126 1/2	380	101 1/2	304	76 1/2	228	47 1/2	142 1/2
20	82 1/2	193 1/2	580	160	480	133 1/2	400	106 1/2	320	80 1/2	240	50 1/2	150 1/2
21	86 1/2	203 1/2	609	168	504	140 1/2	420	112 1/2	336	84 1/2	252	52 1/2	157 1/2
22	90 1/2	212 1/2	638	176	528	146 1/2	440	117 1/2	352	88 1/2	264	55 1/2	165 1/2
23	94 1/2	222 1/2	667	184	552	153 1/2	460	122 1/2	368	92 1/2	276	57 1/2	172 1/2
24	99 1/2	232 1/2	696	192	576	160 1/2	480	128 1/2	384	96 1/2	288	60 1/2	180 1/2
25	103 1/2	241 1/2	725	200	600	166 1/2	500	133 1/2	400	100 1/2	300	62 1/2	187 1/2
Price per Sq. Ft.	Water	1.00	...	1.00	...	1.10	...	1.20	...	1.36	...	1.50	...
	Steam	...	...	...	...	...	...	...	...	...	...	...	...

*In estimating length of radiator allow 1/2 inch for each plug or bushing.

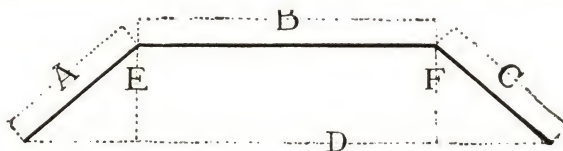
CONTINUED ON NEXT PAGE

"VIKING" WINDOW RADIATORS.

MADE IN CANADA.



ANGLES FOR WATER OR STEAM.



In ordering angle radiators, an exact template should be furnished. When this is not convenient, it will be necessary to have the above diagram.

Care must be taken to give the exact measurements as indicated by letters A, B, C, D, E and F. If twin tapings are required, show their location on the diagram.

CORNER.

WATER AND STEAM.

Orders for corner radiators must state the number of sections required on each side of corner section. All corner radiators for water are tapped single connection.

HIGH LEGS.

All direct radiators of the different heights are fitted on special orders with leg sections of any height ranging from the standard to 18 inches from floor to centre of bottom tapings.

WALL BRACKETS.

Wall brackets are furnished on special orders, for hanging two, three and four column radiators. Orders should plainly state where these brackets are intended to be used, so that the radiator may be supplied without legs.

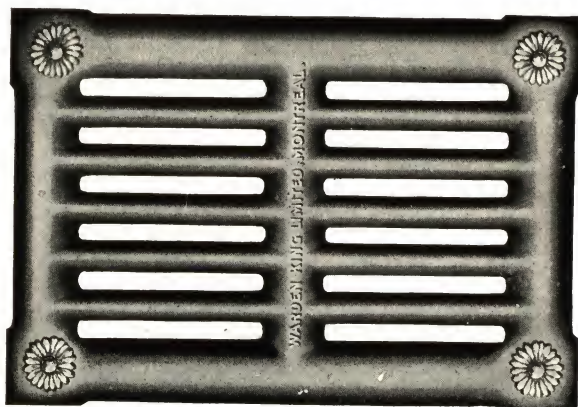
All direct radiators illustrated in this catalogue may be made up in angle, corner high leg, wall bracket, stairway or window styles.

PRICES OF SPECIALS.

These prices have to be added to the regular price of the different radiators:

Circular or Curved, per section.....	\$ 3.00
Angle or Corner, per section.....	15.00
High Legs, 4' to 6' inclusive, per leg section.....	.30
High Legs, 6' to 9' inclusive, per leg section.....	.60
High Legs, 9' to 15' inclusive, per leg section.....	1.20
Wall Hangers for top of radiator, each.....	.60
Wall Hangers for bottom of radiator, each.....	.90

"VIKING" WALL RADIATOR.



7-ft. Section
15 x 17.

9-ft. Section
13 x 24.

List Price, 9-ft. Section, \$1.05 per Sq. Ft.
List Price, 7-ft. Section, \$1.05 per Sq. Ft.

"VIKING" WINDOW RADIATORS.

LISTS, CAPACITIES AND DIMENSIONS.

SIX COLUMN.

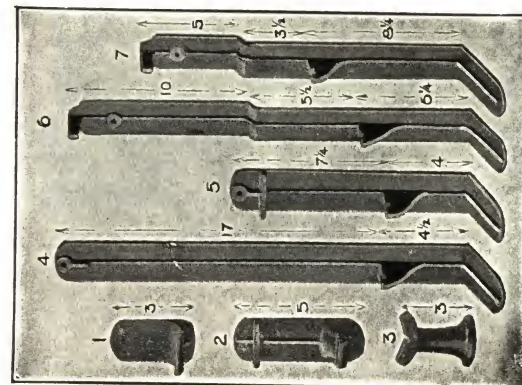
Number of Sections.	Length of Radiator in Inches.	HEATING SURFACE IN SQUARE FEET.			
		20 in. high 6 Sq. Ft. per Section.	18 in. high 6 Sq. Ft. per Section.	16 in. high 4 1/2 Sq. Ft. per Section.	14 in. high 4 1/2 Sq. Ft. per Section.
2	7	12	12	9 1/2	9 1/2
3	10	18	18	14	14
4	13	24	24	18 1/2	18 1/2
5	16	30	30	23 1/2	23 1/2
6	19	36	36	28	28
7	22	42	42	32 1/2	32 1/2
8	25	48	48	37 1/2	37 1/2
9	28	54	54	42	42
10	31	60	60	46 1/2	46 1/2
11	34	66	66	51 1/2	51 1/2
12	37	72	72	56	56
13	40	78	78	60 1/2	60 1/2
14	43	84	84	65 1/2	65 1/2
15	46	90	90	70	70
16	49	96	96	74 1/2	74 1/2
17	52	102	102	79 1/2	79 1/2
18	55	108	108	84	84
19	58	114	114	88 1/2	88 1/2
20	61	120	120	93 1/2	93 1/2
21	64	126	126	98	98
22	67	132	132	102 1/2	102 1/2
23	70	138	138	107 1/2	107 1/2
24	73	144	144	112	112
25	76	150	150	116 1/2	116 1/2

Price per Sq. Ft. . . . {Water.. \$1.36 {Steam.. \$1.40 {Water.. \$1.50 {Steam.. \$1.55

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

Length of radiator is estimated on the basis of 3 in. for each section, plus 1/2 inch on each end for plugs and bushings.

BRACKETS FOR WALL RADIATORS.



Other styles of Brackets to order. Also made with Ceiling Hangers to order.

TAYLOR-FORBES COMPANY, LIMITED

HEAD OFFICE
GUELPH, ONTARIO

TORONTO, ONT.:
TAYLOR-FORBES COMPANY, LIMITED,
1088 KING ST. WEST.

LONDON, ONT.:
T. M. HAYES,
961 WELLINGTON ST.

MARITIME REPRESENTATIVE:
W. H. CAMPBELL,
16 WATER ST., ST. JOHN, N.B.

WINNIPEG:
VULCAN IRON WORKS, LIMITED.

VANCOUVER, B.C.:
TAYLOR-FORBES COMPANY, LIMITED,
1070 HOMER STREET

MONTREAL, QUE.:
TAYLOR-FORBES COMPANY, LIMITED,
246 CRAIG ST. WEST.

OTTAWA, ONT.:
GERALD H. WATKINSON,
217 STRATHCONA AVE.

HALIFAX CITY, N.S.
GUILDFORD & SONS, LIMITED.

REGINA:
ENGINEERS' AND PLUMBERS'
SUPPLY CO., LIMITED.

HAMILTON, ONT.:
W. W. TAYLOR,
19 MOUNT ROYAL AVE.

QUEBEC, QUE.
MECHANICS' SUPPLY CO., LIMITED.

WINDSOR:
PIERCE, BUTLER & PIERCE,
MFG. CORPORATION.

CALGARY:
P. D. McLAREN,
LANCASTER BUILDING

VICTORIA AND VANCOUVER ISLAND:
ANDREW SHERET,
1114 BLANCHARD ST., VICTORIA, B.C.

SOVEREIGN RADIATORS.

COLONIAL PATTERN TWO LOOP.
LIST OF SIZES "COLONIAL" FOR STEAM AND HOT WATER.
EACH LOOP IS $7\frac{1}{2}$ INCHES WIDE AND $2\frac{1}{2}$ INCHES THICK ACROSS HUBS.

Number of Sections	Square Feet of Heating Surface.							
	Length in Inches Over All	45 in. 5 ft. per Section	38½ in. 4 ft. per Section	32½ in. 3½ ft. per Section	30 in. 3 ft. per Section	26½ in. 2½ ft. per Section	23 in. 2¼ ft. per Section	20½ in. 2 ft. per Section
2	6	10	8	6½	6	5½	4½	4
3	8½	15	12	10	9	8	7	6
4	11	20	16	13½	12	10½	9½	8
5	13½	25	20	16½	15	13½	11½	10
6	16	30	24	20	18	16	14	12
7	18½	35	28	23½	21	18½	16½	14
8	21	40	32	26½	24	21½	18½	16
9	23½	45	36	30	27	24	21	18
10	26	50	40	33½	30	26½	23½	20
11	28½	55	44	36½	33	29½	25½	22
12	31	60	48	40	36	32	28	24
13	33½	65	52	43½	39	34½	30½	26
14	36	70	56	46½	42	37½	32½	28
15	38½	75	60	50	45	40	35	30
16	41	80	64	53½	48	42½	37½	32
17	43½	85	68	56½	51	45½	39½	34
18	46	90	72	60	54	48	42	36
19	48½	95	76	63½	57	50½	44½	38
20	51	100	80	66½	60	53½	46½	40
21	53½	105	84	70	63	56	49	42
22	56	110	88	73½	66	58½	51½	44
23	58½	115	92	76½	69	61½	53½	46
24	61	120	96	80	72	64	56	48
25	63½	125	100	83½	75	66½	58½	50



COLONIAL—PLAIN Water or Steam

EMPIRE PATTERN THREE LOOP.
LIST OF SIZES "EMPIRE" FOR STEAM AND HOT WATER.
EACH LOOP IS $8\frac{1}{2}$ INCHES WIDE AND $2\frac{1}{2}$ INCHES THICK ACROSS HUBS.



EMPIRE—PLAIN, WATER OR STEAM

Number of Sections.	Square Feet of Heating Space.					
	Length in Inches Over All.	38½ in. 5 ft. per Section.	32½ in. 4½ ft. per Section.	26½ in. 3¾ ft. per Section.	22 in. 3 ft. per Section.	18 in. 2¼ ft. per Section.
2	6	10	9	7.6	6	4½
3	8½	15	13.6	12.3	9	6¾
4	11	20	18	15.9	12	9
5	13½	25	22.6	18.9	15	11½
6	16	30	27	22.6	18	13½
7	18½	35	31.6	26.3	21	15¾
8	21	40	36	30	24	18
9	23½	45	40.6	33.9	27	20½
10	26	50	45	37.6	30	22½
11	28½	55	49.6	41.3	33	24¾
12	31	60	54	45	36	27
13	33½	65	58.6	48.9	39	29½
14	36	70	63	52.6	42	31½
15	38½	75	67.6	56.3	45	33¾
16	41	80	72	60	48	36
17	43½	85	76.6	63.9	51	38½
18	46	90	81	67.6	54	40½
19	48½	95	85.6	71.3	57	42¾
20	51	100	90	75	60	45
21	53½	105	94.6	78.9	63	47½
22	56	110	99	82.6	66	49½
23	58½	115	103.6	86.3	69	51¾
24	61	120	108	90	72	54

SOVEREIGN RADIATORS

MONARCH PATTERN FOUR LOOP

LIST OF SIZES "MONARCH" FOR STEAM AND HOT WATER.
EACH LOOP IS $8\frac{1}{2}$ INCHES WIDE AND 4 INCHES THICK ACROSS HUBS.



MONARCH—PLAIN, WATER OR STEAM

Number of Sections.	Square Feet of Heating Surface.						
	Length Inches Overall.	42½ in. 9¾ ft. per Section.	38½ in. 8 ft. per Section.	32½ in. 6½ ft. per Section.	26½ in. 5 ft. per Section.	20½ in. 4 ft. per Section.	16½ in 2½ ft. per Section.
2	9	19½	16	13	10	8	5
3	13	29	24	19½	15	12	7½
4	17	38½	32	26	20	16	10
5	21	48½	40	32½	25	20	12½
6	25	58	48	39	30	24	15
7	29	67½	56	45½	35	28	17½
8	33	77½	64	52	40	32	20
9	37	87	72	58½	45	36	22½
10	41	96½	80	65	50	40	25
11	45	106½	88	71½	55	44	27½
12	49	116	96	78	60	48	30
13	53	125½	104	84½	65	52	32½
14	57	135½	112	91	70	56	35
15	61	145	120	97½	75	60	37½
16	65	154½	128	104	80	64	40
17	69	164½	136	110½	85	68	42½
18	73	174	144	117	90	72	45
19	77	183½	152	123½	100	76	47½
20	81	193½	160	130	105	80	50
21	85	203	168	136½	110	84	52½
22	89	212½	176	143	115	88	55
23	93	222½	184	149½	120	92	57½
24	97	232	192	156	125	96	60

SOVEREIGN WALL RADIATORS

FOR WATER AND STEAM.

6-FOOT SECTION.
15-in. wide x 15-in. long.9-FOOT SECTION.
15-in. wide x 22 in. long.12-FOOT SECTION.
15-in. wide x 28 in. long

The 6- and 9-foot sections may be built into any combination of sizes and styles, vertical or horizontal. The 12-foot section is built vertical only.

SOVEREIGN HOSPITAL RADIATORS.

PLAIN PATTERNS ONLY.

2, 3 AND 4 LOOPS WIDE.



FOR WATER OR STEAM
TO ORDER ONLY

THE TABLES OF MEASUREMENTS COVER-
ING THESE RADIATORS ARE SO COMPRE-
HENSIVE THAT IT WILL BE NECESSARY TO
REFER TO OUR ENGINEERS' HAND BOOK
FOR DETAILS.

Hospital Radiators are Built With Sections Wide Apart to Permit of Easy Cleaning.

SOVEREIGN HOT BLAST HEATERS.

REGULAR SECTION—RATINGS AND FREE AREAS.

REGULAR 40" SECTION—10.75 SQUARE FEET.

HEIGHT, 41 $\frac{1}{4}$ ".WIDTH, 9 $\frac{1}{2}$ ".

Number of Loops in Stack	Square Feet of Heating Surface	*Equiv- alent in Lineal Feet 1-inch Pipe	5" Centres of Loops		5½" Centres of Loops		4½" Centres of Loops		Actual Weight of Stack in Pounds	Approximate Weights
			Standard 44% of Face		52% of Face		37% of Face			
			Net Air Space in Square Feet	† Width of Stack in Inches	Net Air Space in Square Feet	† Width of Stack in Inches	Net Air Space in Square Feet	† Width of Stack in Inches		
7	75.25	226	4.34	35	5.12	38	3.67	32	594	7.92 lbs. per sq. ft. actual. 9 lbs. per sq. ft. shipping weight
8	86.00	258	4.96	40	5.85	43	4.20	37	670	
9	96.75	290	5.58	45	6.57	48	4.72	42	728	
10	107.50	323	6.20	50	7.29	54	5.25	46	851	
11	118.25	355	6.82	55	8.02	59	5.77	51	936	
12	129.00	387	7.44	60	8.74	65	6.30	55	1022	
13	139.75	419	8.06	65	9.47	70	6.82	60	1167	
14	150.50	452	8.68	70	10.19	75	7.35	65	1193	
15	161.25	484	9.30	75	10.91	81	7.87	69	1278	

REGULAR 50" SECTION—13.5 SQUARE FEET.

HEIGHT, 50 $\frac{3}{4}$ ".WIDTH, 9 $\frac{1}{2}$ ".

7	94.5	284	5.37	35	6.35	38	4.55	32	717	7.62 lbs. per sq. ft. actual. 9 lbs. per sq. ft. shipping weight
8	108.0	324	6.14	40	7.25	43	5.20	37	810	
9	121.5	365	6.91	45	8.15	48	5.85	42	923	
10	135.0	405	7.68	50	9.05	54	6.50	46	1026	
11	148.5	446	8.45	55	9.95	59	7.15	51	1129	
12	162.0	486	9.22	60	10.85	65	7.80	55	1232	
13	175.5	527	9.99	65	11.75	70	8.45	60	1335	
14	189.0	567	10.76	70	12.65	75	9.10	65	1436	
15	202.5	608	11.53	75	13.55	81	9.75	69	1539	

REGULAR 60" SECTION—16 SQUARE FEET.

HEIGHT, 60 $\frac{1}{2}$ ".WIDTH, 9 $\frac{1}{2}$ ".

7	112.0	336	6.45	35	7.62	38	5.47	32	864	7.74 lbs. per sq. ft. actual. 9 lbs. per sq. ft. shipping weight
8	128.0	384	7.37	40	8.70	43	6.25	37	988	
9	144.0	432	8.29	45	9.77	48	7.03	42	1112	
10	160.0	480	9.21	50	10.85	54	7.81	46	1238	
11	176.0	528	10.13	55	11.93	59	8.59	51	1362	
12	192.0	576	11.05	60	13.00	65	9.37	55	1486	
13	208.0	624	11.97	65	14.08	70	10.15	60	1610	
14	224.0	672	12.89	70	15.15	75	10.93	65	1734	
15	240.0	720	13.81	75	16.23	81	11.71	69	1858	

* NOTE.—The actual length of one inch Pipe per square foot of outside surface is 2.9 lineal feet, but is nominally figured at 3 lineal feet as shown in the third column of the above table.

† NOTE.—Add to the width of stack 2 $\frac{1}{2}$ " for staggering of stacks.

Write for further details of Blast Radiators.

SOVEREIGN HOT WATER BOILERS

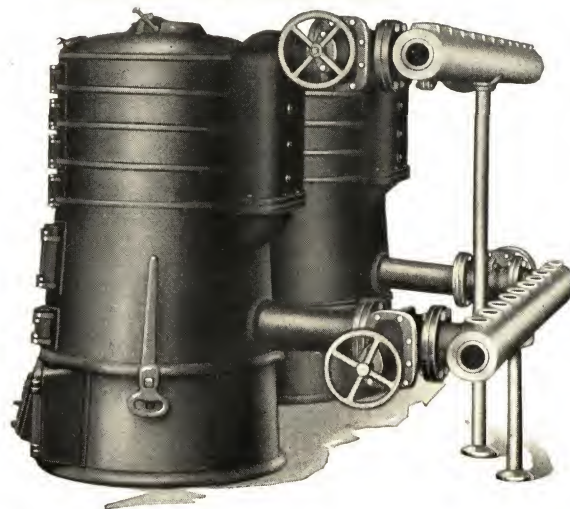


Made Low Base unless specially ordered otherwise. 19 sizes.

SPECIAL FEATURES:

Large Deep Fire Pot.
Large First Section.
Separate Clean-out Doors.
Large Water Post.
Flared Sections.

FOR SOFT OR HARD COAL.



Showing arrangement of Twin, Triple and Quadruple Headers for Sovereign Boilers.

WE DESIGNED THESE BOILERS—WE DID NOT COPY ANY OTHERS.

LIST OF SIZES AND CAPACITIES.

Size or Number.	Number of Sections.	Net Capacity of Radiation not including Mains.	Gross Capacity of Radiation not including Mains.	List Price, Low Base.	Height of Boiler Low Base, Inches.	Inside Diam. Fire Pot, Inches.	Depth Firepot, Inches.	Diameter Smoke Pipe, Inches.	Tapped Regular Openings.		Single Openings Return and Flow, Inches.	Recommended Size of Chimney Flue.	
									Flow, Inches.	Return, Inche		Round Flue.	Square Flue.
0	3	200	300	\$226.00	46	16 1/4	17 3/4	7	3-2	4-2	3 1/2	7	8 1/2 x 8 1/2
00	4	227	340	247.00	50 1/2	16 1/4	17 3/4	7	3-2	4-2	3 1/2	7	8 1/2 x 8 1/2
1	5	250	375	268.00	54 1/4	16 1/4	17 3/4	7	3-2	4-2	3 1/2	7	8 1/2 x 8 1/2
1 1/2	4	300	450	287.00	52	19 1/2	18 3/4	7	4-2	5-2	4	8	8 1/2 x 8 1/2
2	5	365	550	320.00	56 1/4	19 1/2	18 3/4	7	4-2	5-2	4	8	8 1/2 x 8 1/2
2 1/2	4	420	625	356.00	53	21 1/2	18 3/4	8	4-2	5-2	4	8	8 1/2 x 8 1/2
3	5	500	750	382.00	57 1/2	21 1/2	18 3/4	8	4-2	5-2	4	8	8 1/2 x 8 1/2
3 1/2	4	585	875	425.00	55	24 1/2	19 3/4	8	4-2	5-2	4	9	8 1/2 x 10
4	5	685	1025	462.00	60	24 1/2	19 3/4	8	6-2	7-2	5	9	8 1/2 x 10
4 1/2	4	750	1125	498.00	56	26 1/2	19 3/4	10	6-2	7-2	5	9	8 1/2 x 10
5	5	835	1250	550.00	61	26 1/2	19 3/4	10	6-2	7-2	5	10	8 1/2 x 12 1/2
5 1/2	4	935	1400	590.00	61 1/4	28 1/2	20 3/4	10	6-2	7-2	5	10	8 1/2 x 12 1/2
6	5	1000	1500	654.00	66	28 1/2	20 3/4	10	8-2	9-2	6	10	8 1/2 x 12 1/2
6A	4	1100	1650	706.00	62	30 1/2	20 3/4	10	8-2	9-2	6	10	8 1/2 x 12 1/2
6 1/2	5	1250	1875	775.00	66 3/4	30 1/2	20 3/4	12	8-2	9-2	6	11	8 1/2 x 12 1/2
6 1/2 A	4	1350	2025	840.00	63 3/4	32 1/2	21 3/4	12	8-2	9-2	6	12	12 1/2 x 12 1/2
7	5	1500	2250	880.00	68 3/4	32 1/2	21 3/4	12	9-2	10-2	6	12	12 1/2 x 12 1/2
7 1/2	4	1765	2650	945.00	63 3/4	36	21 3/4	12	9-2	10-2	6	12	12 1/2 x 12 1/2
8	5	2000	3000	1,052.00	68 3/4	36	21 3/4	12	9-2	10-2	6	12	12 1/2 x 12 1/2

WESTERN JUNIOR BOILERS

WESTERN JUNIOR STEAM BOILER

REGISTERED AND APPROVED BY ALL PROVINCIAL
GOVERNMENTS

WESTERN JUNIOR HOT WATER BOILER



RATINGS FOR WESTERN JUNIOR WATER BOILERS.

No. of Boiler.	Capacity of Radiation Sq. Ft. not including Mains	List Price.	Height of Boiler to Top of Outlet Inches.	Outside Diam. Inches.	Inside Diam. of Firepot, Inches.	Tappings, Regular.		Diam. of Smoke Pipe, Inches.
						Flow, Inches.	Return, Inches.	
1	210	\$226.00	48 $\frac{3}{8}$	23 $\frac{1}{2}$	16	2-2	2-2	8
2	310	287.00	52	26	19	2-2 $\frac{1}{2}$	2-2 $\frac{1}{2}$	8
3	460	356.00	53 $\frac{3}{8}$	28	20 $\frac{1}{2}$	2-3	2-3	9
4	600	425.00	58 $\frac{1}{2}$	30 $\frac{3}{4}$	24	2-3	2-3	9
4 $\frac{1}{2}$	700	462.00	59 $\frac{3}{8}$	33 $\frac{1}{2}$	26	2-3	2-3	9
5	840	550.00	59 $\frac{3}{8}$	35 $\frac{1}{4}$	28	2-4	2-4	10
6	1100	706.00	60 $\frac{3}{8}$	38 $\frac{1}{2}$	30 $\frac{1}{2}$	2-4	2-4	10

RATINGS FOR WESTERN JUNIOR STEAM BOILERS.

Capacity of Radiation Sq. Ft. not including Mains.	List Price.	Height of Boiler to Top of Outlet, Inches.	Height of Water Line, Inches.	Outside Diam. Inches.	Inside Diam. of Firepot, Inches.	Tappings, Regular.		Diam. of Smoke Pipe, Inches.
						Flow, Inches.	Return, Inches.	
225	\$185.00	48 $\frac{3}{8}$	44 $\frac{3}{8}$	23 $\frac{1}{2}$	16	2-2	2-2	8
300	205.00	52	46	26	19	2-2 $\frac{1}{2}$	2-2 $\frac{1}{2}$	8
400	235.00	53 $\frac{3}{8}$	48 $\frac{1}{8}$	28	20 $\frac{1}{2}$	2-3	2-3	9
500	275.00	58 $\frac{1}{2}$	53	30 $\frac{3}{4}$	24	2-3	2-3	9
600	312.50	59 $\frac{3}{8}$	54 $\frac{3}{8}$	33 $\frac{1}{2}$	26	2-3	2-3	9
700	337.50	59 $\frac{3}{8}$	55 $\frac{1}{4}$	35 $\frac{1}{4}$	28	2-4	2-4	10
950	412.50	60 $\frac{3}{8}$	55 $\frac{3}{8}$	38 $\frac{1}{2}$	30 $\frac{1}{2}$	2-4	2-4	10

RATINGS

The foregoing steam boiler ratings are based on a standard of two (2) pounds pressure at the boiler, and the water ratings are based on a standard of water at a temperature of 180 F. as it leaves the boiler.

All our ratings are direct radiation, and, further, provide that, in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast iron direct radiation to be used.

The surface in mains, if not properly covered, requires more boiler capacity than the same amount of direct radiation.

It is good practice to use a boiler with reserve capacity, and the surface in mains, as well as the radiators, should be figured on above basis, or due allowance made for other temperatures and pressure as well as loss of heat in the mains in determining required capacity.

When a pipe coil or cast-iron section is introduced into the fire-pot, or a steam coil placed in a tank for the purpose of heating water for domestic use, additional capacity should be provided for in estimating size steam or water boiler required at the rate of 1 $\frac{1}{4}$ square feet of direct radiation for steam and 2 square feet of direct radiation for water for each gallon of water to be thus heated per hour.

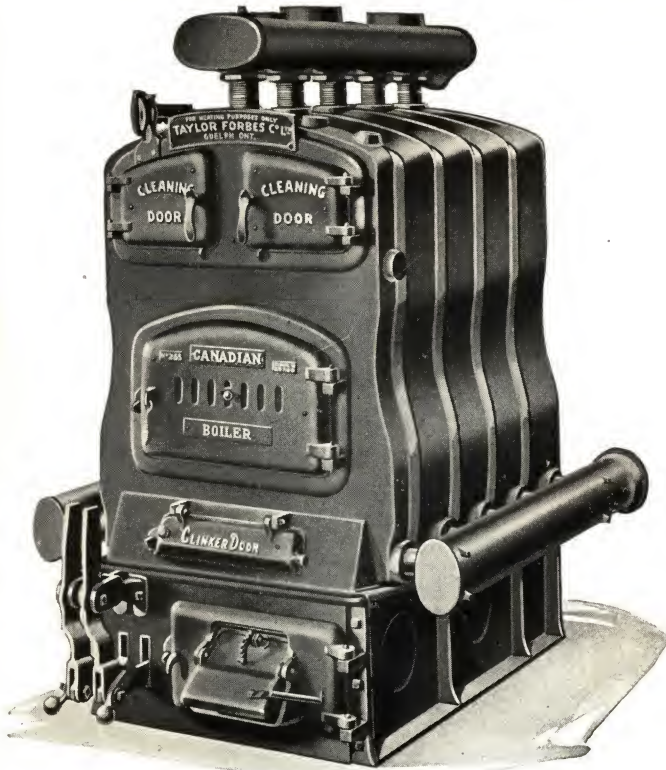
Our ratings are based on the assumption that hard coal is to be used for fuel, and that boilers without a jacket shall be covered with a non-conducting material.

CONTINUED ON NEXT PAGE

CANADIAN WATER AND STEAM BOILERS

REGISTERED AND APPROVED BY ALL PROVINCIAL GOVERNMENTS

CANADIAN HOT WATER BOILER.



DIMENSIONS AND TAPPINGS.

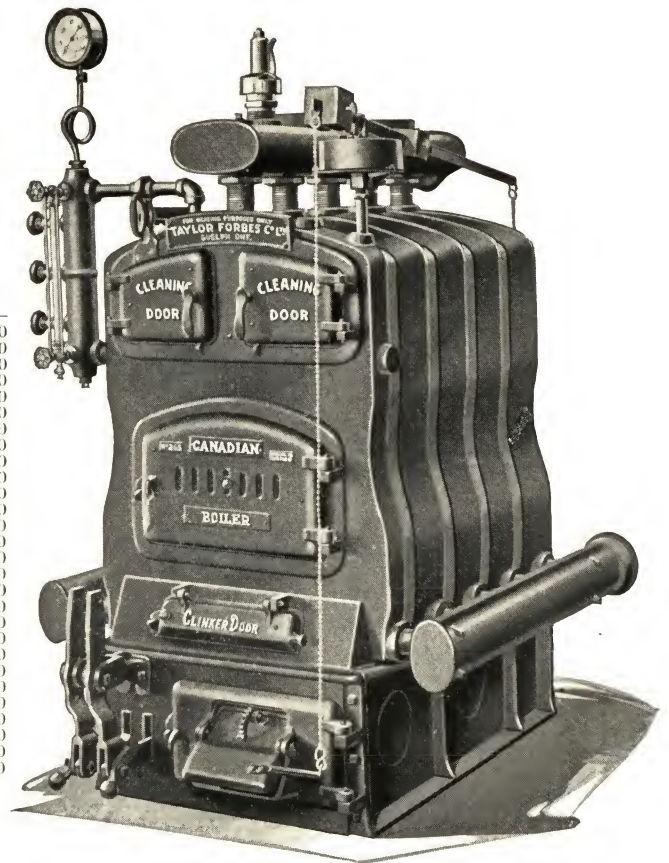
No. of Boiler.	No. of Sections.	Size of Fire Chamber, Inches.	Area of Grate, Inches.	Height of Boiler, Inches.	Length of Boiler, Inches.	Width of Boiler, Inches.	Height of Water Line, Inches.	Flow, Inches.	Return, Inches.	Size of Smoke Pipe, Inches.	Size of Chimney Flue Recommended.	Capacity Radiation Sq. Ft. not including Mains.	List Price.
W-215	5	23 1/2 x 31 3/8	652	60	55	45	44	2-3	2-3	10	12 1/2 x 12 1/2	1325	\$350.00
W-216	6	23 1/2 x 39 3/8	815	60	63	45	44	2-3	2-3	10	12 1/2 x 12 1/2	1650	400.00
W-217	7	23 1/2 x 47 3/8	978	60	71	45	44	2-3	2-3	10	12 1/2 x 12 1/2	2000	450.00
W-265	5	29 1/2 x 31 3/8	800	65 1/2	55	53	51	2-3	2-3	10	12 1/2 x 12 1/2	1750	437.50
W-266	6	29 1/2 x 39 3/8	1000	65 1/2	63	53	51	2-4	2-4	12	12 1/2 x 12 1/2	2250	487.50
W-267	7	29 1/2 x 47 3/8	1200	65 1/2	71	53	51	2-4	2-4	12	12 1/2 x 17	2700	562.50
W-268	8	29 1/2 x 55 3/8	1400	65 1/2	79	53	51	2-4	2-4	12	12 1/2 x 17	3150	625.00
W-325	5	36 x 31 3/8	992	68 1/2	55	61	53	2-4	2-4	14	12 1/2 x 17	2325	500.00
W-326	6	36 x 39 3/8	1240	68 1/2	63	61	53	2-4	2-4	14	12 1/2 x 17	2900	600.00
W-327	7	36 x 47 3/8	1488	68 1/2	71	61	53	2-5	2-5	14	12 1/2 x 17	3475	687.50
W-328	8	36 x 55 3/8	1736	68 1/2	79	61	53	2-5	2-5	14	17 x 17	4050	762.50
W-329	9	36 x 63 3/8	1984	68 1/2	87	61	53	2-5	2-5	14	17 x 17	4625	837.50
W-3210	10	36 x 71 3/8	2232	68 1/2	95	61	53	2-5	2-5	14	17 x 17	5200	925.00
W-405	5	43 3/4 x 31 3/8	1248	71	55	69	54	2-5	2-5	14	12 1/2 x 17	3150	625.00
W-406	6	43 3/4 x 39 3/8	1560	71	63	69	54	2-5	2-5	14	12 1/2 x 17	3975	775.00
W-407	7	43 3/4 x 47 3/8	1872	71	71	69	54	2-5	2-5	14	17 x 17	4800	862.50
W-408	8	43 3/4 x 55 3/8	2184	71	79	69	54	2-5	2-5	14	17 x 17	5625	1,037.50
W-409	9	43 3/4 x 63 3/8	2496	71	87	69	54	2-6	2-6	16	17 x 21	6450	1,150.00
W-4010	10	43 3/4 x 71 3/8	2808	71	95	69	54	2-6	2-6	16	17 x 21	7275	1,212.50
W-4011	11	43 3/4 x 79 3/8	3120	71	103	69	54	2-6	2-6	16	17 x 21	8100	1,350.00
W-466	6	53 x 40	1840	82	60	84	63	2-5	2-5	16	17 x 17	5200	925.00
W-467	7	53 x 48	2208	82	68	84	63	2-6	2-6	18	17 x 21	6275	1,087.50
W-468	8	53 x 56	2500	82	76	84	63	2-6	2-6	18	17 x 21	7350	1,250.00
W-469	9	53 x 64	2944	82	84	84	63	2-6	2-6	18	21 x 21	8425	1,462.50
W-4610	10	53 x 72	3312	82	92	84	63	2-8	2-8	20	21 x 21	9500	1,575.00
W-4611	11	53 x 80	3680	82	100	84	63	2-8	2-8	20	21 x 25 1/2	10575	1,775.00
W-4612	12	53 x 88	4048	82	108	84	63	2-8	2-8	20	21 x 25 1/2	11650	1,925.00
W-4613	13	53 x 96	4416	82	116	84	63	2-8	2-8	20	21 x 25 1/2	12725	2,037.50

This is the only type of Boiler on the market that can be repaired without disconnecting or taking down the whole boiler.

CANADIAN STEAM BOILER.

DIMENSIONS AND TAPPINGS.

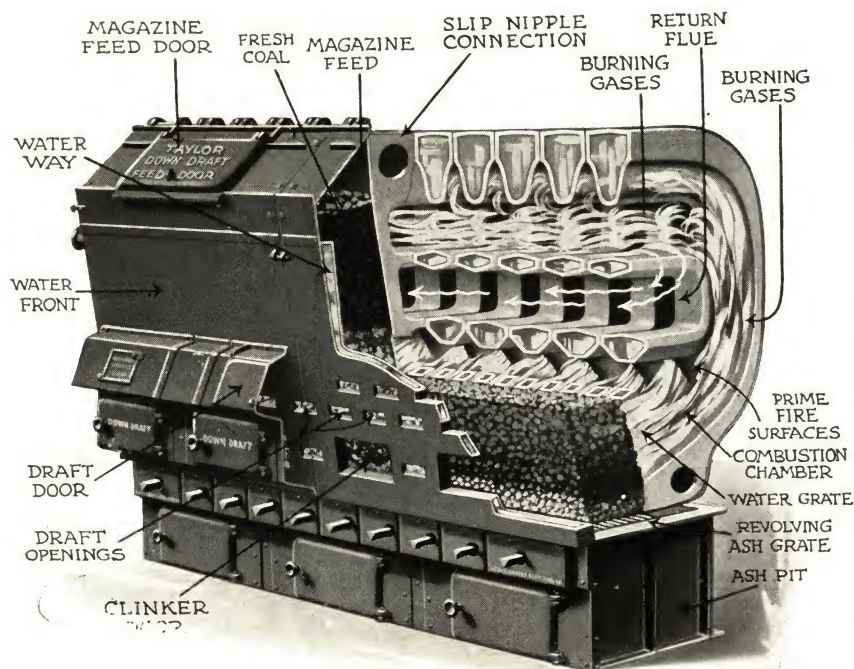
No. of Boiler.	No. of Sections.	Size of Fire Chamber, Inches.	Area of Grate, Inches.	Height of Boiler, Inches.	Length of Boiler, Inches.	Width of Boiler, Inches.	Height of Water Line, Inches.	Flow, Inches.	Return, Inches.	Size of Smoke Pipe, Inches.	Size of Chimney Flue Recommended.	Capacity Radiation Sq. Ft. not including Mains.	List Price.
S-215	5	23 1/2 x 31 3/8	652	60	55	45	44	2-2 1/2	2-2 1/2	10	12 1/2 x 12 1/2	800	\$375.00
S-216	6	23 1/2 x 39 3/8	815	60	63	45	44	2-2 1/2	2-2 1/2	10	12 1/2 x 12 1/2	1000	425.00
S-217	7	23 1/2 x 47 3/8	978	60	71	45	44	2-2 1/2	2-2 1/2	10	12 1/2 x 12 1/2	1200	475.00
S-265	5	29 1/2 x 31 3/8	800	65 1/2	55	53	51	2-2 1/2	2-2 1/2	10	12 1/2 x 12 1/2	1150	462.50
S-266	6	29 1/2 x 39 3/8	1000	65 1/2	63	53	51	2-3	2-2 1/2	12	12 1/2 x 12 1/2	1350	512.50
S-267	7	29 1/2 x 47 3/8	1200	65 1/2	71	53	51	2-3	2-2 1/2	12	12 1/2 x 17	1625	587.50
S-268	8	29 1/2 x 55 3/8	1400	65 1/2	79	53	51	2-3	2-2 1/2	12	12 1/2 x 17	1900	650.00
S-325	5	36 x 31 3/8	992	68 1/2	55	61	53	2-3	2-2 1/2	14	12 1/2 x 17	1400	525.00
S-326	6	36 x 39 3/8	1240	68 1/2	63	61	53	2-3	2-2 1/2	14	12 1/2 x 17	1800	625.00
S-327	7	36 x 47 3/8	1488	68 1/2	71	61	53	2-4	2-3	14	12 1/2 x 17	2150	712.50
S-328	8	36 x 55 3/8	1736	68 1/2	79	61	53	2-4	2-3	14	17 x 17	2450	787.50
S-329	9	36 x 63 3/8	1984	68 1/2	87	61	53	2-4	2-3	14	17 x 17	2800	875.00
S-3210	10	36 x 71 3/8	2232	68 1/2	95	61	53	2-4	2-3	14	17 x 17	3200	975.00
S-405	5	43 3/4 x 31 3/8	1248	71	55	69	54	2-4	2-3	14	12 1/2 x 17	1900	650.00
S-406	6	43 3/4 x 39 3/8	1560	71	63	69	54	2-4	2-3	14	12 1/2 x 17	2550	812.50
S-407	7	43 3/4 x 47 3/8	1872	71	71	69	54	2-4	2-3	14	17 x 17	2900	900.00
S-408	8	43 3/4 x 55 3/8	2184	71	79	69	54	2-4	2-3	14	17 x 17	3600	1,075.00
S-409	9	43 3/4 x 63 3/8	2496	71	87	69	54	2-5	2-4	16	17 x 21	4050	1,187.50
S-4010	10	43 3/4 x 71 3/8	2808	71	95	69	54	2-5	2-4	16	17 x 21	4500	1,300.00
S-4011	11	43 3/4 x 79 3/8	3120	71	103	69	54	2-5	2-4	16	17 x 21	4950	1,412.50
S-466	6	53 x 40	1840	82	60	84	63	2-4	2-3	16	17 x 17	3250	989.50
S-467	7	53 x 48	2208	82	68	84	63	2-5	2-4	18	17 x 21	3800	1,125.50
S-468	8	53 x 56	2500	82	76	84	63	2-5	2-4	18	17 x 21	4450	1,287.50
S-469	9	53 x 64	2944	82	84	84	63	2-5	2-4	18	21 x 21	5400	1,525.00
S-4610	10	53 x 72	3312	82	92	84	63	2-6	2-4	20	21 x 21	5850	1,637.50
S-4611	11	53 x 80	3680	82	100	84	63	2-6	2-4	20	21 x 25 1/2	6650	1,837.50
S-4612	12	53 x 88	4048	82	108	84	63	2-6	2-4	20	21 x 25 1/2	7250	1,987.50
S-4613	13	53 x 96	4416	82	116	84	63	2-6	2-4	20	21 x 25 1/2	7700	2,100.00



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TAYLOR DOWN DRAFT STEAM AND WATER BOILERS

TAYLOR DOWN DRAFT WATER BOILER



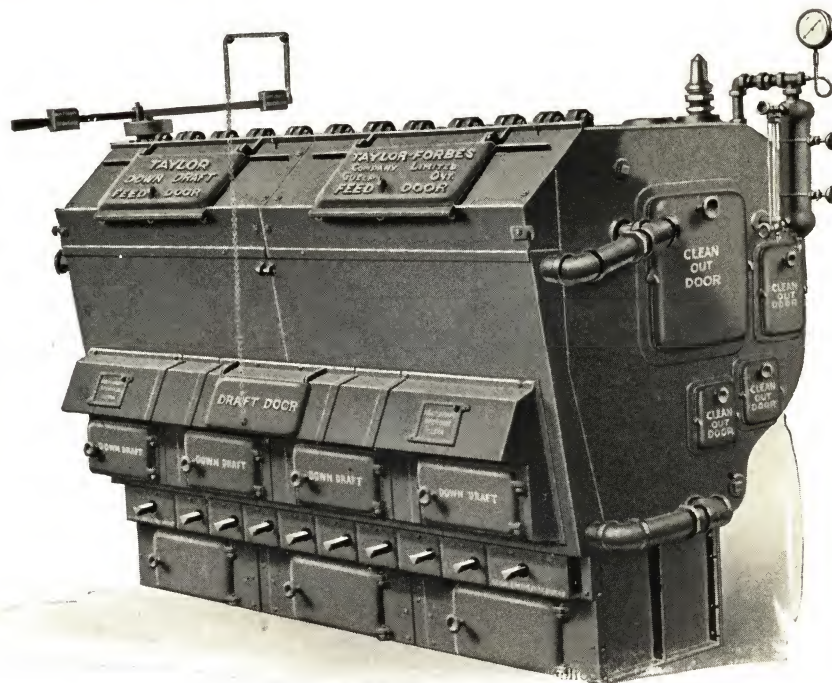
DIMENSIONS AND CAPACITIES.

Boiler Number.	No. of Sections.	Total Length, Inches.	No. and Size of Outlets, Inches.	No. and Size of Returns, Inches.	Diameter of Smoke Pipe, Inches.	Size Chimney Flue Inches.		Minimum Height of Chimney, Feet.	Rating.	List Price.
						Brick Unlined.	Round Tile Inside Measurement is Commercial Size.			
W- 844	4	50	2-4	2-4	10	12½x12½	14	35	1500	PRICES ON APPLICATION
W- 845	5	57	2-4	2-4	10	12½x12½	14	40	2050	
W- 846	6	64	2-4	2-4	10	12½x17½	16	40	2650	
W- 847	7	71	3-4	3-4	10	12½x17½	16	45	3200	
W- 848	8	78	3-4	3-4	12	17½x17½	18	45	3900	
W- 849	9	85	3-4	3-4	12	17½x17½	18	50	4625	
W-8410	10	92	3-4	3-4	12	17½x21	20	50	5450	
W-8411	11	100	4-4	4-4	12	17½x21	20	55	6275	
W-8412	12	108	4-4	4-4	12	17½x21	20	60	7100	

TAYLOR DOWN DRAFT STEAM BOILER

DIMENSIONS AND CAPACITIES.

Boiler Number.	No. of Sections.	Total Length, Inches.	No. and Size of Outlets, Inches.	No. and Size of Returns, Inches.	Diameter of Smoke Pipe, Inches.	Size Chimney Flue, Inches.		Minimum Height of Chimney, Feet.	Rating.	List Price.
						Brick Unlined.	Round Tile Inside Measurement is Commercial Size.			
S- 844	4	55	2-4	2-4	10	12½x12½	14	35	900	PRICES ON APPLICATION
S- 845	5	62	2-4	2-4	10	12½x12½	14	40	1250	
S- 846	6	69	2-4	2-4	10	12½x17½	16	40	1600	
S- 847	7	76	3-4	3-4	10	12½x17½	16	45	1950	
S- 848	8	83	3-4	3-4	12	17½x17½	18	45	2350	
S- 849	9	90	3-4	3-4	12	17½x17½	18	50	2800	
S-8410	10	98	3-4	3-4	12	17½x21	20	50	3300	
S-8411	11	105	4-4	4-4	12	17½x21	20	55	3800	
S-8412	12	112	4-4	4-4	12	17½x21	20	60	4300	



TANK HEATERS

TAYLOR TANK HEATER.
FOR HOT WATER.

DIMENSIONS AND PRICE LIST.

No. of Boiler.	Heat- ing Capacity.	Tank Capacity.	Height of Heater, Inches.	Outside Diam. Inches.	Size of Grate, Inches.	Tappings.		Diam. of Smoke Pipe, Inches.	List Price.
						Flow, Inches.	Return, Inches.		
210	450	675	45½	Low	Base.	3	3	7	\$245.00
				23	20				
211	450	675	53¼	High	Base.	3	3	7	260.00
				23	20				

IMPROVED GIANT STEAM BOILER.
FOR ANY KIND OF FUEL.

DIMENSIONS AND PRICE LIST

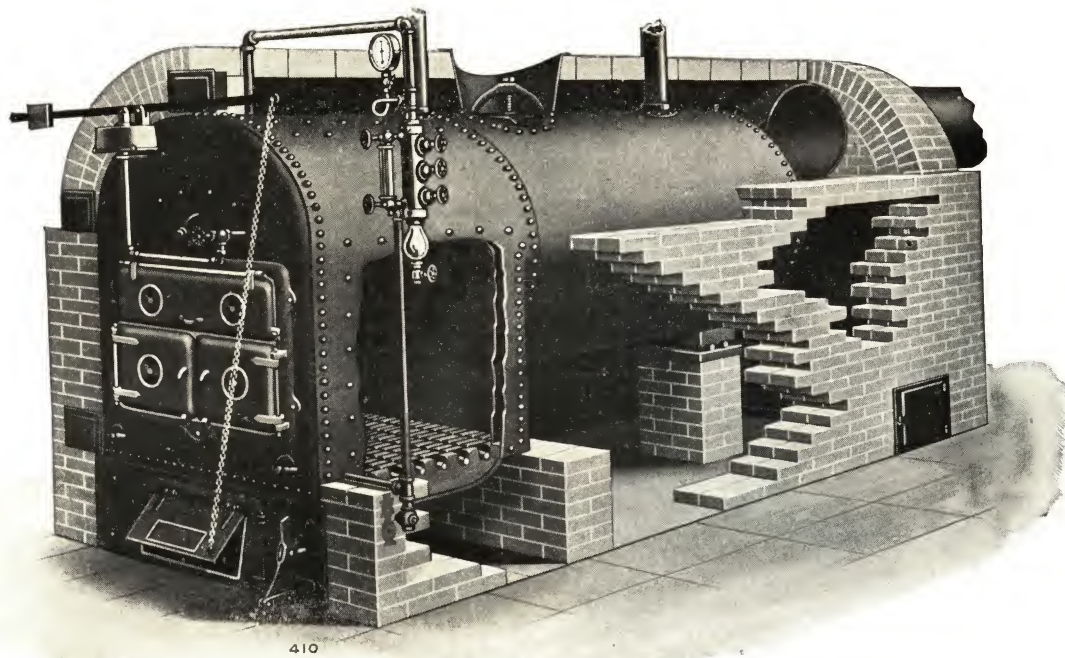
No. of Boiler.	Heat- ing Capacity.	Height of Boiler, Inches.	Outside Diam., Inches.	Size of Grate, Inches.	Tappings.		Diam. of Smoke Pipe, Inches.	List Price.
					Flow, Inches.	Return, Inches.		
125	100	44½	15	12	2	2	6	\$200.00
165	175	49½	19	16	2½	2½	6	270.00
205	275	52½	23	20	3	3	7	350.00

ADANAC TANK AND LAUNDRY HEATER.

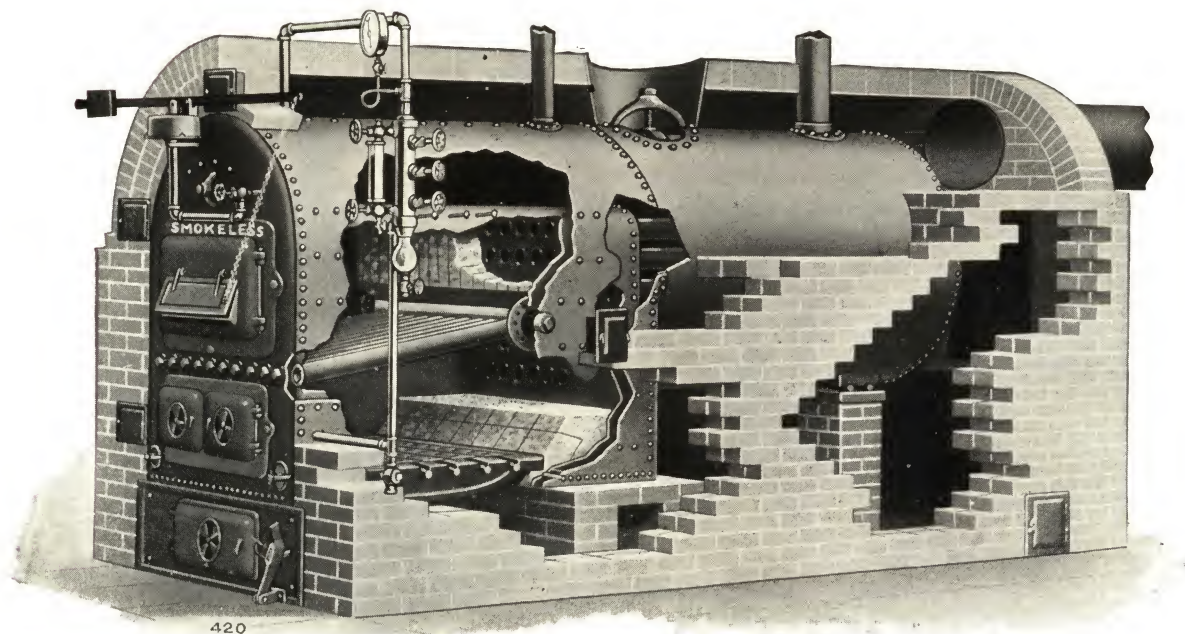


No. of Boiler.	Tank Capacity Gallons.	Height of Heater, Inches.	Size of Top, Inches.	Extreme Front to Rear Measurement, Inches.	Size of Grate, Inches.	Size of Outlet, Inches.	Size of Inlet, Inches.	Size of Smoke Pipe, Inches.	List Price.
9	55	23¼	15x21½	20¼	8	1-1	1-1	6	\$36.50

TAYLOR-FORBES FIREBOX HEATING BOILERS.



STANDARD TYPE (BRICK SET)

SMOKELESS TYPE (BRICK SET)
SPECIAL CATALOGUE SUPPLIED ON REQUEST.

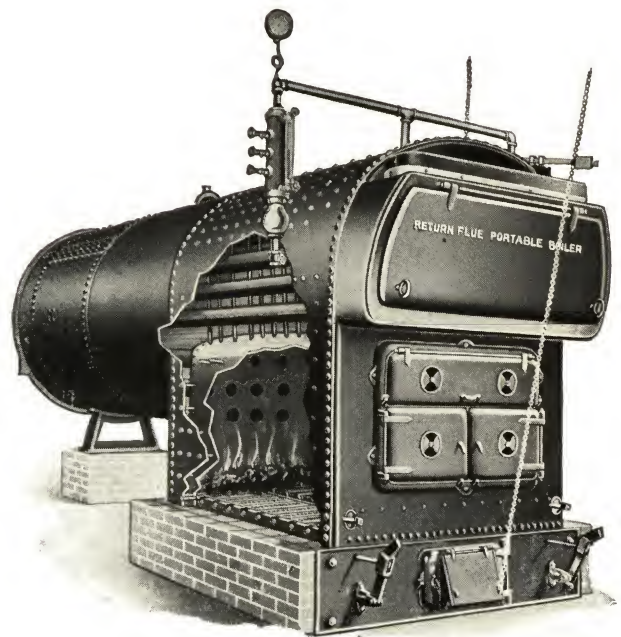
TAYLOR-FORBES PORTABLE FIREBOX HEATING BOILERS



STANDARD TYPE (PORTABLE)

BOILERS NO. 407, 408 AND 409
ARE FURNISHED WITH CAST IRON
ASH PIT

BOILERS NO. 307, 308 AND 309
ARE FURNISHED WITH CAST IRON
ASH PIT



SMOKELESS TYPE (PORTABLE)
SPECIAL CATALOGUE SUPPLIED ON REQUEST.

THE CANADIAN POWERS REGULATOR CO., LIMITED

82 CHESTNUT STREET,
TORONTO.

AGENCIES—MONTREAL—ENGINEERS' SUPPLY COMPANY, New Birks Building.

WINNIPEG—WALSH & CHARLES, Tribune Bldg.

VANCOUVER—ESTEY-BOISON, LTD. 634 ROGERS BUILDING.

CALGARY—A. WALKER, McLEAN BUILDING.

PRODUCTS.

AUTOMATIC TEMPERATURE CONTROLLING APPARATUS: For Schools, Churches, Residences, Office Buildings, etc., for various mechanical processes, for sterilizers, drying ovens, etc. Wherever artificial heat is supplied and uniform temperature desired, our heat regulating apparatus may be employed.

AUTOMATIC HUMIDITY CONTROL: For all classes of buildings.

SERVICES.

We are contracting engineers for the design and installation of our appliances. We maintain branch offices in the principal cities with a competent engineering and construction force, so as to insure the proper application of our apparatus. Powers Regulation has been in use for the past 20 years throughout the United States and Canada, and thousands of buildings have been equipped with it. Except in the case of a few specialties all installations are made by our own construction departments.

SPECIAL FEATURES.

The Powers Temperature Controlling Appliances and Systems stand pre-eminent in the field by reason of their simplicity and durability. The thermostats are all constructed upon the well-known vapour-disc principle which has now been used by us for the past 20 years with the greatest success. They are powerful in their action and free from the fine air passages, delicate springs and complicated mechanisms which characterize other devices used in this class of work. Great attention is paid to design and finish of apparatus, and, where desired, the thermostats will be provided in special finishes to match the hardware or decorative scheme of the rooms in which they are located.

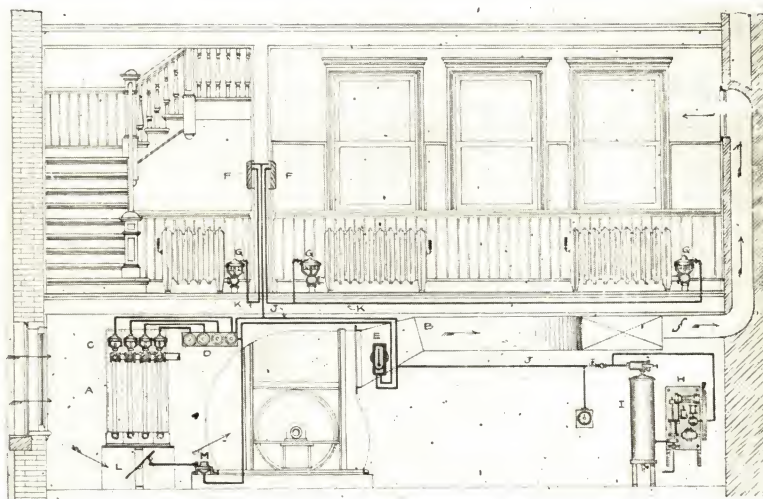
DESCRIPTION OF SYSTEM.

Temperature control is accomplished by means of an instrument called a thermostat, which responds sensitively to temperature changes, and, using compressed air as a motive power, automatically regulates the supply of heating medium to the apartment where the thermostat is installed. Each apartment must have its thermostat and each radiator or other heat source its pneumatic valve or damper controlling the heat supply, all being connected together by a system of air piping communicating with an air compressor of suitable design.



Powers Thermostat and Radiator Valve.

In Plate 3 we show a typical application of automatic temperature control as applied to the modern building with direct radiation in the rooms and mechanical ventilation. The room shown is typical of the others, in the fact that it is equipped with a thermostat "F" and diaphragm valves "GG" on the radiators. This room is also supplied with indirect heat for ventilating purposes, this coming from the blower which draws it through the heating coils "A." A thermostat, "E," located in the blower discharge controls automatically the steam supply to the coils, at the same time operating the by-pass damper beneath them for the purpose of passing unheated air whenever necessary. This thermostat will secure a constant delivery of air at a specified temperature, usually 70 degrees. The radiators in the rooms will furnish the additional heat necessary, and under the control of their thermostats will do it automatically. Our system of temperature control is applied with equal facility to steam or hot water heat, giving either the positive or graduated control of valves as may be desired.



Typical application of Powers Regulation to Direct Steam Heating Plant with fan ventilation. (School House Type.)

SPECIFICATION.

Send for our Special Detailed Specification.

JOHNSON TEMPERATURE REGULATING CO. OF CANADA, LTD.

CALGARY, ALTA., 605 SECOND STREET WEST. TORONTO, ONT., 145 WELLINGTON STREET WEST.
MONTREAL, QUE., 284 BEAVER HALL HILL. WINNIPEG, MAN., 259 STANLEY STREET.
VANCOUVER, B.C., 550 SIXTH AVENUE WEST.

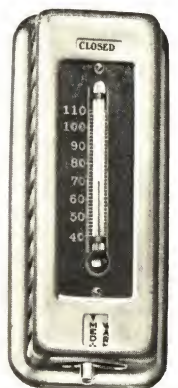
PRODUCTS.

The Johnson System of Automatic Temperature Regulation and Humidity Control for regulating and controlling the temperature and the humidity of all kinds of buildings, particularly schools and other public buildings, offices, residences and factories. Equally efficient on any form of heating and ventilating, steam, air or water.

Thermostats, humidostats, metal diaphragm valves, dampers, switches, and all kinds of apparatus for automatically controlling temperature and humidity in dry kilns, bake ovens, cold storage rooms, and similar places where uniformity of temperature is required to produce the best results.

JOHNSON POSITIVE ACTING METAL DIAPHRAGM THERMOSTAT.

The only ALL-METAL thermostat on the market, having no soft or hard rubber parts to deteriorate and become inoperative. The only thermostat with a positive snap action for closing and opening valves quickly, positively, and fully, which is necessary for satisfactory and durable operation of steam valves. The only thermostat having an indicator which shows at a glance whether the thermostat has the heat on or off, and convenient means for shutting off the heat permanently when desired. This thermostat is the result of the development of thirty-five years of experience in this business and is the most perfect and efficient instrument of its kind so far produced.



MODEL PI
THERMOSTAT.
4 3/4 inches high, 2 inches
wide, 1 inch deep.

JOHNSON GRADUATED ACTING THERMOSTAT.

This thermostat conforms in size and general construction to the positive thermostat above described, and is its equal in quality in every respect, but operates with a graduated motion instead of with a positive motion, and is therefore the most desirable and adaptable to that form of heating and ventilating where mixing dampers are to be controlled.

THERMOSTAT COVERS.

The covers which conceal the mechanism of the thermostat proper are the same for both positive acting and graduated acting movements or mechanism. They are very small, inconspicuous and neat in design and workmanship.

There are two distinct styles: one called the R type, and one called the P type.

The R type is a die-casting, very beautifully designed and used generally in residences and other handsomely decorated buildings.

The P type is a pressed metal cover, very finely finished, but not as ornamental and artistic as the R cover, and used more generally in schools, office buildings, hospitals and places where simple and neat design is desired rather than artistic and ornamental.

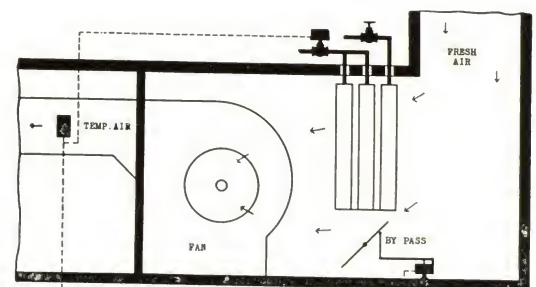
INSERTION DUCT THERMOSTATS.

These thermostats are identical in principle, quality, and construction with the room thermostats above described, but are constructed in such form that the sensitive element can be inserted in a duct or plenum chamber exposed to the temperature therein, but have the mechanism outside in an accessible place.

These thermostats are made either to control a single, individual valve or damper at any desired temperature, positively or intermediately, and are termed Unit Duct Thermostats, or to control a series of valves such as are usually located on a bank of steam coils, one after the other at predetermined, desired temperatures, and are known as multiple thermostats.

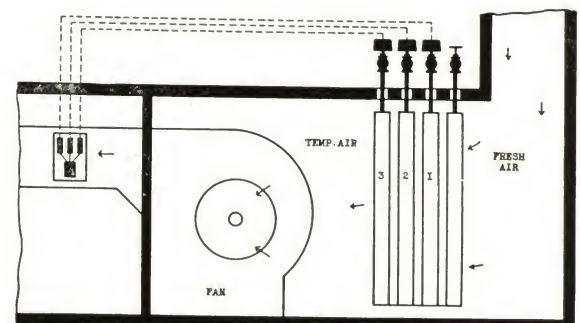
TANK THERMOSTATS.

This thermostat is similar to the inserted duct thermostat, but is so constructed that the sensitive element can be inserted in a tank or pipe and exposed to liquid. It can be used to control the temperature of any liquid, either hot or cold, and is especially adaptable for controlling the temperature of hot water tanks.



TEMPERED FAN VENTILATION.

Thermostat, located in the duct from fan, controls by-pass damper under the tempering coils, or coils themselves, when there is no by-pass provided. Some engineers prefer to control both by thermostat. (See also multiple insertion thermostats.)

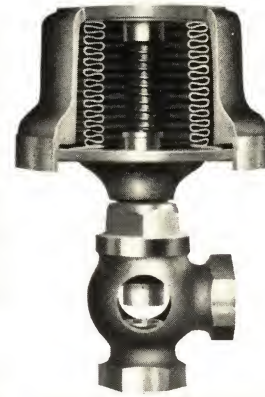


TEMPERED FAN VENTILATION.

The 3-point multiple thermostat here takes the place of single insertion thermostat. There is no by-pass damper, and temperature of ventilating air is regulated by coil control. For instance, section 1 opens at 68°; section 2 at 67°; section 3 at 66°. Thus, as the weather gets colder, the thermostat has more radiation under control.

"SYLPHON" VALVES.

Diaphragm valves are obviously of equal necessity and importance to the thermostat in a complete system of temperature regulation. Because for many years no other suitable material was obtainable, rubber formed the diaphragms for these valves, but in the production of the "Sylphon," a metal diaphragm valve equal in efficiency to the rubber but permanently durable and absolutely indestructible was made possible, removing entirely the one great objection to automatic heat regulation, which is the perishable characteristic of rubber. The "Sylphon" seamless metal diaphragm valve is furnished by the Johnson Service Company for radiators, blast coils, hot water tanks, and, in fact, for any place where a steam valve is required, and in any sizes and commercial shapes. The "Sylphon" is also used in the construction of pneumatic motors for the operation of dampers.



"SYLPHON" METAL DIA-
PHRAGM VALVE.

HUMIDITY CONTROL.

The supplying of moisture to the heated air in buildings and the automatic control of the percentage of moisture in this air are recognized by authorities to be as important as maintaining proper temperatures.

Humidity is indispensable for museums and fine residences to protect valuable pictures, furniture, wood carvings, etc. It is even more valuable for the protection of life in homes, schools, hospitals, etc.

HUMIDOSTATS AND HUMIDIFIERS.

The humidostat automatically controls the supply of moisture delivered to the air by a humidifier and maintains a constant percentage of relative humidity. It operates a diaphragm valve on the steam coils in the pan humidifier. The pan is provided with float box to maintain constant water level and is located in the ventilating air duct leading throughout the building. Steam jet and water spray types of humidifiers are also furnished.

PNEUMATIC SWITCH CONTROL.

Remote valve and damper control plays, by means of our pneumatic switches, a very important part in the economical operation of the modern heating plant, especially in schools. It saves the janitor's time for other duties, and makes it possible to accomplish results in the operation of the heating plant which cannot be obtained in any other way. It makes it easy to operate the fresh air, return air and vent dampers, with the corresponding assurance that these dampers will be economically operated as intended by the heating engineer.



PNEUMATIC SWITCH.

AIR COMPRESSORS.

Electric, hydraulic, steam or belt driven compressors of all sizes are furnished and installed by this company to supply the small amount of compressed air necessary to operate Johnson thermostats, diaphragm valves, switches and other apparatus. They are entirely automatic in operation and require only the usual, ordinary care given to such classes of apparatus.

HOW TO SPECIFY.

Furnish and install the Johnson All Metal system of automatic temperature regulation and humidity control, furnishing all necessary thermostats, valves, dampers, humidifiers, special devices, air compressors, piping and fittings, and labor of installing system, except setting valves and dampers in position—all in accordance with the following schedule and detailed specification:

SCHEDULE—State the rooms to be controlled and number of thermostats in each; the manner in which the tempered air, if there is any, is to be controlled; the manner in which the drafts of the boiler are to be controlled; and specify the manner of the control of any fresh air, vent or return air dampers, stating the location and number of switches.

THERMOSTATS—Specify Johnson Model Thermostat, size $4\frac{1}{2}$ " by 2" by 1"; and state whether it is to have residence or school cover, indicating device, positive shut-off, and whether it is to be positive or intermediate motion. Specify the number and kind of inserted thermostats.

VALVES—Specify the "Sylphon" Metal Diaphragm Valve, and state whether it is to be plain or nickel plated, with or without unions, adding that these valves will be placed in position by the heating contractor.

AIR COMPRESSORS—Specify kind of air compressor (steam, hydraulic, electric or power driven), requiring that the air compressor shall be of sufficient size to operate the system, with a factor of safety not less than 3, and requiring that it be provided with all necessary governing devices, fittings, gage, etc.

HUMIDOSTATS—Specify Johnson Humidostat and Humidifier, stating the kind of humidifier, whether perforated steam or copper evaporating pan.

DAMPERS—Specify that dampers shall be made by the heat regulating contractor, but installed by the galvanized iron contractor, and that dampers shall consist of wrought iron frames, sheet steel blades, strongly cleated, with brass bearings.

GUARANTEE—Require that system be complete in every respect, and that all necessary material and special fittings shall be furnished whether specifically mentioned or not. Require that entire system be guaranteed free from all original defects in material and workmanship, and that any parts proving defective or wearing out within 2 years from date of completion shall be replaced free of charge. Require that thermostats shall operate the valves or dampers to which they are attached, at a variation of not to exceed 1° above or below any given point. Require that both thermostats and valves shall be constructed entirely of metal.

HOFFMAN SPECIALTY CO., INC.

MANUFACTURERS OF HEATING SPECIALTIES.

MAIN OFFICE AND FACTORY:

WATERBURY, CONN. U.S.A.

CANADIAN REPRESENTATIVES: CRANE, LIMITED, MONTREAL.

HAVING BRANCHES IN:

CALGARY, ALTA.
WINNIPEG, MAN.

HALIFAX, N.S.
REGINA, SASK.

OTTAWA, ONT.
HAMILTON, ONT.

TORONTO, ONT.
SHERBROOKE, QUE.

VANCOUVER, B.C.
VICTORIA, B.C.

PRODUCTS.

SIPHON AIR VALVES; ADJUSTABLE MODULATING VALVES; RETURN LINE VALVES; SIPHON AIR AND VACUUM VALVES; "AIR LINE VALVES; "QUICK VENT" AIR VALVES; "QUICK VENT FLOAT" AIR VALVES; "QUICK VENT FLOAT" AIR AND VACUUM VALVES; VAPOR VALVES; DIFFERENTIAL LOOP.



TRADE-MARK.

GUARANTEE.

Upon request of the Architect we furnish the Owner a written guarantee covering the satisfactory operation of Hoffman Valves for a period of five (5) years from date of installation.

HOFFMAN VALVES.

The design and construction of Hoffman valves are the result of over thirty years' experience in the heating business. We have devoted the last 17 years to the perfecting of dependable venting devices for low pressure steam heating systems, and through radical departures in valve design have been able to produce them. These devices are absolutely non-adjustable, therefore fool-proof, and perform automatically the functions for which they are designed.

Tests—All Hoffman venting valves are shipped ready to be put in place. They are thoroughly tested, accurately adjusted, and adjustment sealed before they leave the factory.

MATERIALS.

Every part of the Hoffman Valve is made of a composition alloy specially adapted for the particular requirements of the part. Valve Pins are of a special tough silver alloy; Diaphragms, phosphor bronze; Formed and Drawn Parts of a close grained composition that resists operating strains. All valves are heavily nickel-plated and present a neat, compact, serviceable appearance.

No. 1 HOFFMAN SIPHON AIR VALVE.

PURPOSE—This valve is designed for use on gravity systems of steam heating.

CONSTRUCTION AND OPERATION—The combined thermostatic member and float is a sealed metal chamber with a flexible diaphragm. It contains a volatile or heat sensitive fluid which vaporizes when the thermostat is in contact with steam, generating an internal vapor pressure which deflects the diaphragm and thereby closes the valve. The fluid is sealed in the float under a vacuum and is of such a nature that it is possible to keep the vent port either wide open or shut tightly with no intermediate position. Such positive action permits all air to escape from the radiator, for full vent port opening is maintained until steam reaches the valve when instantaneous closure is made.

The action of the fluid during venting period is as follows:—Air at a temperature of 180° or less has no effect on the fluid pressure. With temperatures above 180° vaporization commences, but as the vaporization takes place under a vacuum no internal pressure will be generated which will affect the diaphragm action until 195° is reached. At this point vapor pressure begins to exceed atmospheric pressure and with temperatures between 205° and 207° the internal vapor pressure forces the diaphragm outward thus instantly closing the vent port. The result of this sensitive valve action is that all air is vented from the radiator, whether cold or heated, through a wide open vent port. Premature closing with the resultant loss in heating efficiency is eliminated as well as the disagreeable hissing which occurs with a partly closed vent port. The Hoffman Valve is noiseless in operation.

The sensitiveness of the valve in distinguishing between live steam and heated air insures full efficiency of the radiator.

Another function of the float is to take care of any sudden charge of water within the radiator. The valve closes instantly against water leakage whenever water reaches it. When water in radiator drops away from valve, the siphon automatically discharges the water in the valve into the radiator without leakage, because the necessary replacing air flows into the valve through separate distinct channels as the water leaves the valve.

The arrows in the sectional view show the direction of the flow of water through the siphon and the flow of air into the valve. It will be noted that air entering the valve can not pass through the water in the float chamber, but must enter through channels provided for it. Note also that the outlets from these channels are above the water line in the float chamber, therefore, when the valve port opens, even though there is water in the valve, the air passes out through the valve port, perfectly dry. There is not the slightest spit. The valve closes tightly without the slightest leakage as often as water comes against it, and opens instantly without leakage whenever water leaves it.

ADVANTAGES—(1) The No. 1 Hoffman siphon air valve distinguishes perfectly and effectively between steam and air and between water and air. (2) Its air channels are separate from those provided for water. (3) It closes tightly against steam or water, but freely vents all air from the radiator, whether the air is hot or cold, and permits steam to replace the air that is vented, thereby maintaining full radiator efficiency.

The No. 7 Hoffman Adjustable Modulating Valve is intended for use in vapor or vapor vacuum systems and is made in 3/4" size only with a range of adjustment which permits its use on direct radiators up to 200 sq. ft. of heating surface.

After installation the valve may be adjusted whether the system is in operation or cold for the particular requirements of the radiator to which it is attached. Adjustment is easily and quickly made by loosening a locknut, then turning the valve handle until the proper number of graduations are visible on the dial plate. Locknut is then tightened and the amount of steam admitted to the radiator can be controlled to bring into action any desired amount of heating surface.

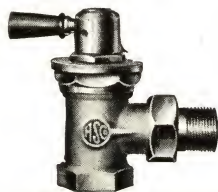
It is the only valve of its type which can be externally adjusted to supply the proper amount of steam to each radiator and at the same time permit the user to modulate or control the amount of heat given off by the radiator.

The stuffing box of the valve is of special construction with metallic-fibre packing that will last indefinitely and require no attention. In opening and closing, the valve action is so free that only the pressure of one finger is required to vary the amount of steam admitted to the radiator.

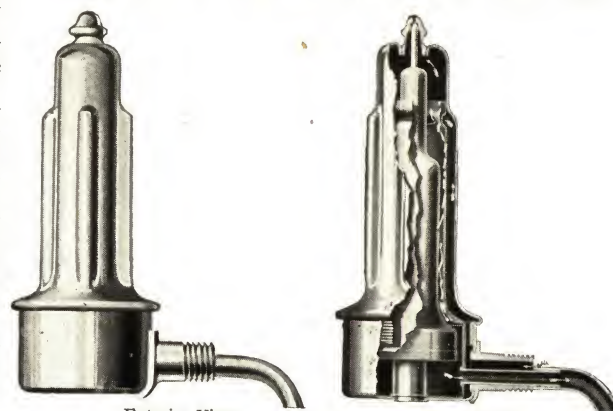
The No. 7 Valve is regularly supplied with lever handle as illustrated, but on special orders it can be furnished with wood wheels, lock shields or closed top. For concealed radiators the valve can be furnished with an extension stem and handle.

No. 8 AND 9 HOFFMAN RETURN LINE VALVE.

PURPOSE—This valve is for use on vapor, vapor-vacuum, modulating and vacuum heating systems. DESCRIPTION—The Hoffman return line valves are automatic and non-adjustable. The sectional illustration below clearly shows that radical departure has been made in its mechanical design. The first, last, and only function of a thermostatic return line valve is to positively distinguish between steam, air and water, freely permitting the passage of air and water which may



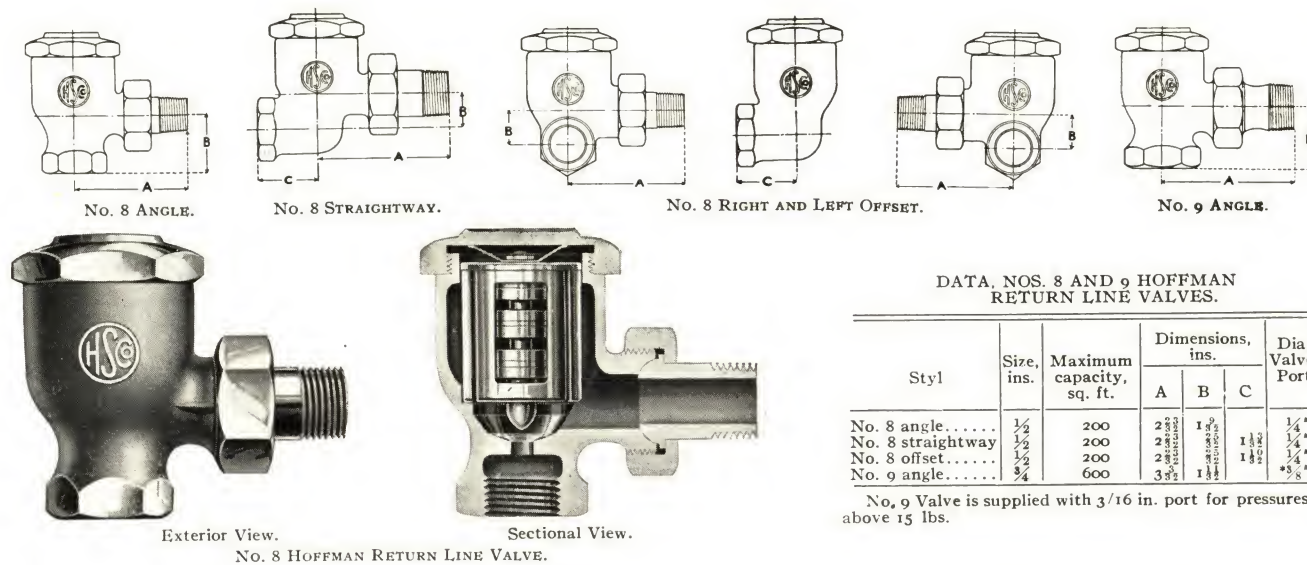
NO. 7 HOFFMAN ADJUSTABLE
MODULATING VALVE.



Exterior View.

Sectional View.

NO. 1 HOFFMAN SIPHON AIR VALVE.



DATA, NOS. 8 AND 9 HOFFMAN RETURN LINE VALVES.

Styl	Size, ins.	Maximum capacity, sq. ft.	Dimensions, ins.			Dia. Valve Port
			A	B	C	
No. 8 angle.....	1/2	200	2 1/2	1 1/2	1 1/2	1/4"
No. 8 straightway.....	1/2	200	2 1/2	1 1/2	1 1/2	1/4"
No. 8 offset.....	1/2	200	2 1/2	1 1/2	1 1/2	1/4"
No. 9 angle.....	3/4	600	3 1/2	1 1/2	1 1/2	3/8"

No. 9 Valve is supplied with 3/16 in. port for pressures above 15 lbs.

No. 8 AND 9 HOFFMAN RETURN LINE VALVE —(Continued)

come to it, but stopping steam. The Hoffman return line valve has a long valve travel, which means a wide open unobstructed passage when the flood of condensation reaches the valve; thus minimizing the lodgment of dirt therein and interfering with its proper operation.

In order to get this movement thermostatically and at the same time preserve three vital essentials in a thermostatic return line valve, i.e., efficiency, durability and non-adjustability, three small thermostatic chambers (they are only 1 in. in diameter) with a nickel alloy flexible diaphragm top and bottom of each chamber, making six diaphragms in all, are assembled in a cage. The three chambers are joined together in the center and are made practically into one thermostatic chamber, by having an opening through the center connections between the chambers. These chambers are then suspended from the top of the cage, the valve pin being rigidly attached to the bottom diaphragm. This method of construction insures not only that the thermostatic travel or movement of the chambers will be the total collective movement of the separate diaphragms, but also that the movement will be absolutely vertical; and the valve pin, being guided by the bottom of the cage, is insured proper seating.

The chief feature of the valve is its consistency of operation under a pressure range from 13" vacuum to 50 lbs. pressure. Within this range water at a temperature of 12° less than the temperature corresponding to the steam pressure will cause a full valve opening. This uniform sensitiveness under any pressure within the specified limits insures practically instantaneous release of condensation as soon as it reaches the valve. It is by means of a special Thermostatic fluid whose pressure and temperature maintain a constant relationship with the pressures and temperatures of steam that the uniformity of action under varying pressures is always maintained.

ADVANTAGES—(1) The Hoffman return line valve is absolutely noiseless and positively distinguishes steam, air and water from one another. (2) It freely passes air and water, but prevents the passage of steam. (3) The valve is non-adjustable. (4) The thermostat parts are interchangeable and may be shifted from one valve to another without affecting the proper operation of the valve. (5) The valve operates at various pressures without adjustment. (6) The valve may be used as a steam trap in industrial work or for draining steam jacketed kettles, sterilizers and similar apparatus.

SIZES—Hoffman return line valves are made in 1/2-in. and 3/4-in. sizes only. The No. 8 valve with 1/2-in. connections is made in angle, straightway and right- or left-hand offset patterns. When straightway or offset patterns are wanted, they should be specified. The 3/4-in. valve designated as No. 9 is made in the angle pattern only.

The standard port of all No. 8 valves is 1/4-in. diameter. The standard port of the No. 9 valve for pressures up to 15 lbs. is 3/8-in. diameter.

For pressures above 15 lbs. the No. 9 valve is furnished with 3/16 in. port.

CAPACITIES—The capacity of any return valve or trap is determined by the temperature and the pressure of the water at the valve. The conservative capacity of the No. 8 (1/2-in.) valve is 200 sq. ft. of cast iron radiator surface. The capacity of the No. 9 (3/4-in.) valve is 600 sq. ft. of cast iron radiator surface.

To determine valve capacity for blast coils the condensing power of the coils should be calculated as four to six times greater than that of radiator cast iron service. The minimum outside temperature determines which factor should be used.

ADAPTABILITY—This valve is designed for use on gravity vacuum systems.

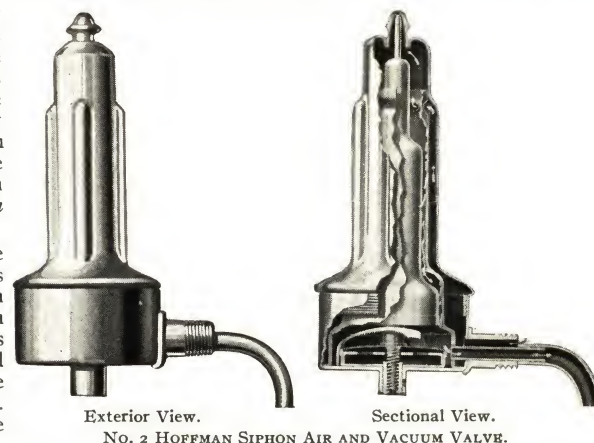
DESCRIPTION—When a pressure of 4 oz. or more reaches this valve, it acts exactly as the No. 1 Hoffman siphon air valve. The description of that valve is a duplication of all of this one except in one particular—its vacuum feature.

The function of any air valve is to vent the air from the radiator when steam enters it, and then to close when steam fills it. The ordinary air valve, however, when steam pressure goes off and the steam in the radiator begins to cool and condense, opens and allows the air to return into the radiator. Since fuel is consumed to produce the pressure necessary to push the air from the radiator, fuel economy results if air is kept out after it has been expelled. The Hoffman siphon air and vacuum valve freely vents air at a pressure of more than 4 oz., and automatically closes to prevent the emission of steam or water. *It also closes automatically to prevent the intake of air through vent port when the pressure goes off.*

CONSTRUCTION AND OPERATION—The sectional view shows that the outlet is normally closed, and that the float pin is held tightly against its seat by the upward pressure of a small bronze diaphragm in the bottom of the valve. The port in the *bottom* of the valve leads to this diaphragm chamber and is always open, so that any pressure within the valve tends to deflect the diaphragm, the upward tension of which is so adjusted that 4 oz. of pressure, or more, will deflect it. As the float follows the diaphragm downward the valve port in the *top* of the valve opens. Temperature has nothing to do with this function of the valve; pressure opens it, lack of pressure closes it.

ADVANTAGES—(1) The No. 2 Hoffman siphon air and vacuum valve, when cold, is normally closed, but opens as soon as a pressure of more than 4 oz. reaches it. (2) If water comes against it, it closes and prevents water leakage through the valve. (3) As soon as the water that has caused it to close drops away, it opens without spitting. (4) It closes instantly if steam reaches it. (5) If pressure goes off, the valve instantly and automatically closes against the intake of air into the radiator through the valve. (6) It vents all air that is in the radiator, and does not let any air enter through the vent port. (7) It is absolutely automatic in all its functions. (8) It holds heat in the radiators and reduces fuel consumption.

No. 2 HOFFMAN SIPHON AIR AND VACUUM VALVE.



Exterior View. Sectional View.
No. 2 HOFFMAN SIPHON AIR AND VACUUM VALVE.

OTHER
TYPES
OF VALVES.

No. 3 HOFFMAN AIR LINE VALVE is a compact, well constructed valve for Air Line, or as they are frequently termed "Paul" Systems. It is sensitive in action and closes the instant steam fills the radiator. No adjustment is necessary either before or after installation. The No. 3 Hoffman Air Line Valve has $\frac{1}{8}$ " male radiator connection with $\frac{1}{4}$ " Air Line connection.

The No. 4 HOFFMAN QUICK VENT VALVE is designed for use in venting risers or return mains where water will not come in contact with the valve. All air is freely vented through a $\frac{1}{8}$ " vent port without steam loss, but valve will not prevent escape of water.

The standard connection of the No. 4 Hoffman Quick Vent Air Valve is $\frac{3}{4}$ ", but it can also be supplied with $\frac{1}{4}$ " connection.

The No. 5 HOFFMAN QUICK VENT FLOAT AIR VALVE is of the triple duty type, intended for venting return mains, indirect stacks and for use under all conditions where water is present in the system. It vents all air, closes tightly against steam and prevents escape of water through vent port. Installed on the end of return mains in one pipe gravity systems, this valve causes steam to first flow to the end of the main, then into the radiators at a uniform rate, so that radiators distant from the boiler will receive their supply of steam as quickly as those close to boiler.

No. 5 Hoffman Quick Vent Float Air Valve has $\frac{3}{8}$ " pipe connection; furnished with 3-16" port for pressure below 3 lbs.; 1-16" port for 3 lbs. or over.

The No. 6 HOFFMAN QUICK VENT FLOAT AIR AND VACUUM VALVE is similar in design to the No. 5 valve with the addition of the diaphragm in the base of the valve which holds the vent port closed when venting ceases and prevents intake of air through the valve port. The valve should be used for venting return lines of small vapor-vacuum systems or wherever return of air to the system is not desirable.

No. 6 Hoffman Quick Vent Float Air and Vacuum Valve, pipe connection $\frac{3}{8}$ ", vent port for less than 3 lbs. is 3-16"; for 3 lbs. and over use 1-16" port.

ADAPTABILITY—The No. 10 Hoffman Vapor Valve is intended for venting the return mains of large vapor systems or for any service where large capacity is required and steam, air or water must be properly handled.

DESCRIPTION—The valve is made entirely of metal; is automatic, non-adjustable and thermostatic. The main or $\frac{3}{4}$ " port controlled by the float has an auxiliary port $\frac{1}{8}$ " in diameter. The purpose of this double valve is to permit venting even though pressure is maintained after a surge of water recedes from the valve. An air way equivalent to a $\frac{3}{4}$ " diameter valve port is maintained throughout the valve permitting venting with little resistance.

Diameter of air port is $\frac{3}{4}$ -in. and this is maintained through the valve. Hence there can be no back pressure in the air line due to restricted air port.

The valve is equipped with large buoyant float which instantly closes the valve port whenever water reaches the valve.

OPERATION—The valve when cold is always open for free passage of air; but as soon as steam reaches valve, the volatile fluid in the thermostatic chamber vaporizes, generating sufficient pressure to distend the flexible diaphragm on top and bottom of these chambers, thus pushing the valve pin to its seat, which closes the valve port tight stopping passage of steam.

The No. 10 Hoffman Vapor Valve distinguishes positively between air, steam and water, freely venting the air no matter whether hot or cold, but instantly closing against passage of steam. It also closes tight against water leakage when water comes against the valve. Valve has $\frac{3}{4}$ " pipe connections.

No. 10
HOFFMAN
VAPOR
VALVE.No. 11
HOFFMAN
VAPOR VA-
CUUM VALVE

The No. 11 HOFFMAN VAPOR VACUUM VALVE is similar in construction to the No. 10 valve with the addition of a check valve on the vent port which prevents the return of air to the system through the vent port. It is widely used for venting the return mains of the vapor-vacuum systems or for other conditions where the return of air to the system after having been vented, is not desirable. No. 11 Hoffman Vapor-Vacuum Valve is fitted with $\frac{3}{4}$ " connection.

The HOFFMAN DIFFERENTIAL LOOP is an extremely simple, yet efficient device, which prevents water from backing up in the return main, and at the same time maintains a constant differential pressure between steam main and return line whenever the pressure exceeds a pre-determined amount. In standard Loops for residential work, the usual pressure at which the Loop operates is 10 ounces. The standard Loop should not be installed where the difference between the lowest point in the return main is less than 24" above the boiler water line.

By means of a water column which seals the connection between the steam and return main without the use of moving parts, a small quantity of steam is "blown over" into the return main whenever the differential pressure between the two mains is such that water would back up into the returns. The presence of steam in the return mains closes the thermostatic venting valve, compresses the air which is in the return, and builds up a pressure until the required differential pressure is obtained to stop the rise of water in the return beyond the pre-determined height.

WIDE DIS-
TRIBUTION
OF HOFFMAN
VALVES.

Hoffman Differential Loops are made in four standard sizes, the largest one having a capacity up to 10,000 sq. ft. of direct radiation. Larger sizes are made to order for the individual requirements of each installation.

Every jobber of steam heating and plumbing supplies in the United States and Canada is a Hoffman representative, and carries in stock most of the various patterns of Hoffman valves.

SPECIFICA-
TION INFOR-
MATION.

The information that follows is furnished by the HOFFMAN SPECIALTY Co., Inc., to guide architects in specifying Hoffman valves for various kinds of steam heating systems.

SPECIFICATION DATA FOR LOW PRESSURE ONE-PIPE GRAVITY STEAM JOBS (OPEN SYSTEM).

AUTOMATIC AIR VALVES—Heating contractor to operate heating apparatus several days, using old automatics or pet cocks. At the beginning of test, prime boiler with 5 gals. of vinegar through safety valve opening. During this preliminary test, boiler should be blown off not less than 3 times under 10-lb. pressure. At the completion of this test, furnish and connect to each radiator in building one No. 1 Hoffman Siphon Air Valve. Contractor shall furnish owner with a written guarantee from the manufacturer covering the satisfactory operation of the venting valves for five years from date of installation. (Note: The use of vinegar cuts or neutralizes oil and grease in system, preventing boiler from foaming; and by giving the Hoffman air valve a clean job, insures long and uninterrupted service on its part.)

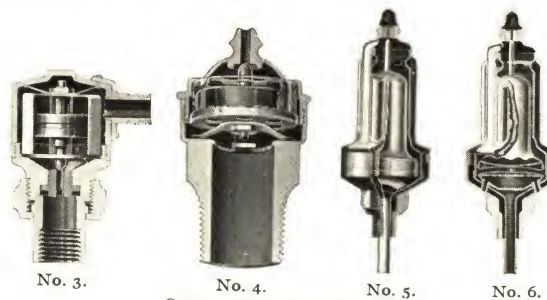
SPECIFICATION DATA FOR LOW PRESSURE ONE-PIPE COMBINATION PRESSURE AND VACUUM STEAM JOBS (CLOSED SYSTEM).

AIR AND VACUUM VALVES—Heating contractor to operate heating apparatus several days, using old automatics or pet cocks. At the beginning of test, prime boiler with 5 gals. of vinegar through safety valve opening. During this preliminary test, boiler should be blown off not less than three times under 10-lb. pressure. At the completion of this test, furnish and connect to each radiator in building one No. 2 Hoffman Siphon Air and Vacuum Valve. Contractor shall furnish owner with a written guarantee from the manufacturer covering the satisfactory operation of the venting valves for five years from date of installation. (Note: The use of vinegar cuts or neutralizes oil and grease in system, preventing boiler from foaming; and by giving the Hoffman air and vacuum valve a clean job, insures long and uninterrupted service on its part.)

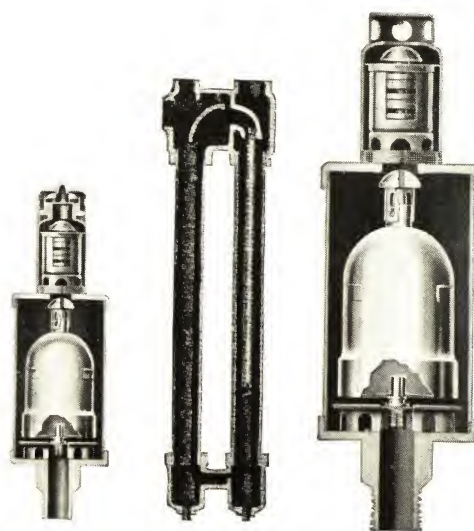
"QUICK VENT" VALVES—Each return main, before it drops below the water line, must be equipped with one No. 4 Hoffman Junior "Quick Vent" Air Valve, in order to relieve the basement piping of all air.

Note for Architects—Should return main exceed 3 ins., or distance between return line and water line less than 15 ins., it is strongly recommended that the No. 5 Hoffman "Quick Vent Float" Air Valve be used instead of No. 4 Hoffman Junior "Quick Vent" Valve.

Note for Architects—It is advisable to use packless radiator valves with this method of heating. They are not absolutely necessary, if the ordinary radiator valves are thoroughly packed. In order to get full and efficient service from the use of these valves, it is necessary that the system as a whole be made as near airtight as possible. This the heating contractor must see to. It is recommended that a compound pressure and vacuum gauge be used to ascertain amount of vacuum on system.



OTHER HOFFMAN VALVES.

No. 11 HOFFMAN
VAPOR VACUUM
LOOPSHOFFMAN
DIFFERENTIAL
LOOP.Sectional View
No. 10 HOFFMAN
VAPOR VALVE.

SPECIFICATION DATA FOR VAPOR, VAPOR VACUUM, MODULATING AND VACUUM JOBS.

MODULATING VALVES—Heating contractor is to equip each radiator of 200 sq. ft. and under with a $\frac{3}{4}$ " No. 7 Hoffman Adjustable Modulating Valve with wide open port as received from the manufacturer. After system has been operated for a short time and thoroughly cleaned, contractor shall adjust each valve for the particular radiator to which it is attached.

RETURN LINE VALVES—Heating contractor to furnish and connect to each radiator in building one $\frac{1}{2}$ -in. No. 8 Hoffman Return Line Valve for radiators of 200 sq. ft. or less. Where pipe coils exceed 200 sq. ft. of radiation, or where drips are employed to carry condensation from mains into air return line, one $\frac{3}{4}$ -in. No. 9 Hoffman Return Line Valve to be used. Offset and straightway valves to be installed wherever specified by architect. Before system is accepted as complete by architect, heating contractor must remove thermostats and permit system to operate for at least 3 weeks without using interior part of valves. This insures an absolutely clean system. After this is done, thermostats must be replaced, and final test must be made in presence of architect or architect's representative. Contractor shall furnish owner with a written guarantee from the manufacturer covering the satisfactory operation of the venting valves for five years from date of installation.

Install where shown on plans one Hoffman Differential Loop to maintain a constant water level in the boiler and hold a predetermined differential pressure between the main steam line and return air line.

Note for Architect—For Vapor Heating we recommend the use of the No. 10 Hoffman Vapor Valve for venting the Return Mains. For Vapor Vacuum Systems the No. 11 Valve should be used for venting the return mains.

Both No. 10 Vapor Valves and No. 11 Vapor Vacuum Valves are designed to vent all air from the entire system without the use of other venting devices.

For the convenience of the architect and heating contractor we have classified the necessary specialties for vapor or vapor vacuum systems as follows. This list of specialties comprises those necessary for practically all standard vapor or vapor vacuum installations.

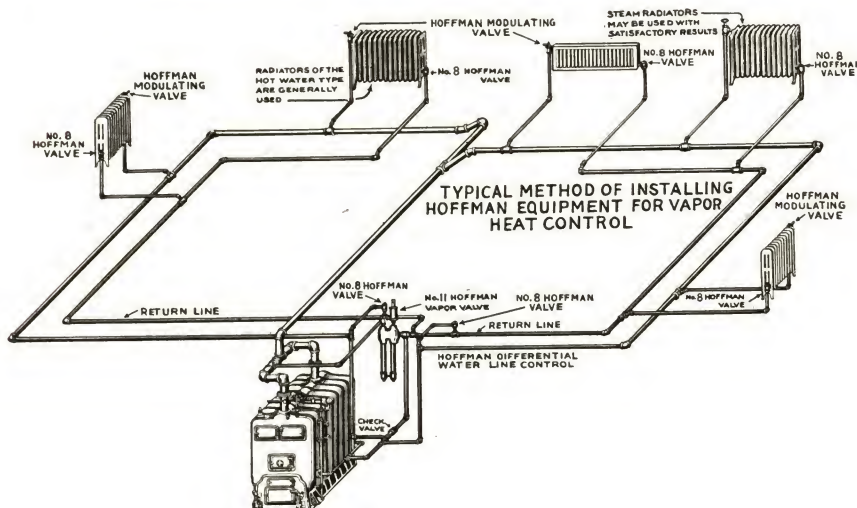
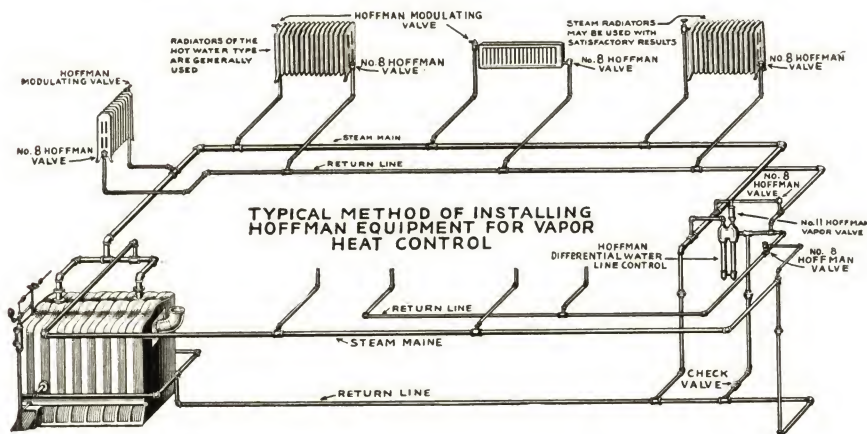
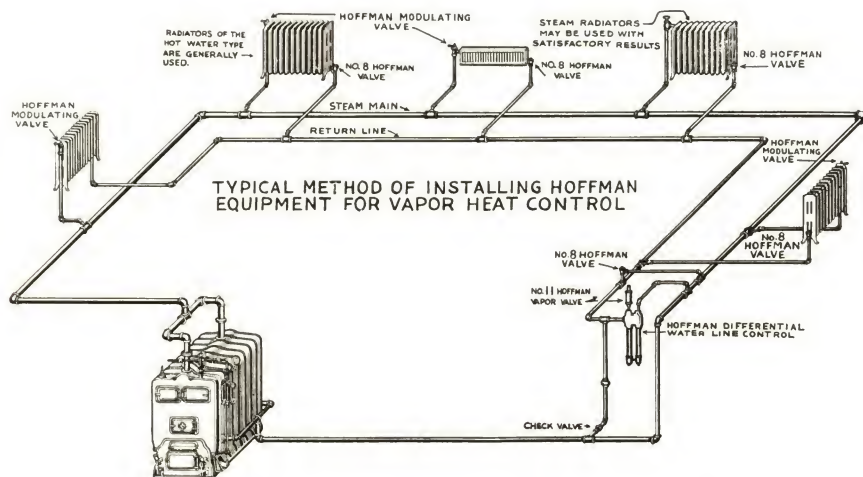
RADIATOR SPECIALTIES—1 No. 7 Hoffman Adjustable Modulating Valve (Capacity up to 200 sq. ft. radiation); 1 No. 8 Hoffman Return Line Valve (Capacity up to 200 sq. ft. radiation).

CLASS A BASEMENT SPECIALTIES—For installations up to 1500 sq. ft. direct radiation, consisting of: 2 No. 8 Hoffman Return Line Valves for venting steam mains; 1 No. 1 Hoffman Differential Loop; 1 No. 11 Hoffman Air Eliminator; 1 Damper Regulator; 1 Pressure Gauge.

CLASS B BASEMENT SPECIALTIES—For installations of 1501 to 3000 sq. ft. direct radiation, consisting of: 3 No. 8 Hoffman Return Line Valves for venting steam mains; 1 No. 2 Hoffman Differential Loop; 1 No. 11 Hoffman Air Eliminator; 1 Damper Regulator; 1 Pressure Gauge.

CLASS C BASEMENT SPECIALTIES—For installations of 3001 to 5000 sq. ft. direct radiation, consisting of: 4 No. 8 Hoffman Return Line Valves for venting steam mains; 1 No. 3 Hoffman Differential Loop; 2 No. 11 Hoffman Air Eliminators; 1 Damper Regulator; 1 Pressure Gauge.

CLASS D BASEMENT SPECIALTIES—For installations of 5001 to 10,000 sq. ft. direct radiation, consisting of: 6 No. 8 Hoffman Return Line Valves for venting steam mains; 1 No. 4 Hoffman Differential Loop; 2 No. 11 Hoffman Air Eliminators; 1 Damper Regulator; 1 Pressure Gauge.



TYPICAL LAYOUTS SHOWING METHOD OF INSTALLING HOFFMAN "CONTROLLED HEAT" SPECIALTIES IN VAPOR AND VAPOR-VACUUM SYSTEMS.

IMPORTANT NOTES.

The typical systems herewith shown illustrate the manner of installing Hoffman Specialties in various types of vapor and vapor-vacuum systems. The simplicity of the layouts is worthy of note; for, in systems where Hoffman Valves are used, the arrangement of piping is not unlike that of the two-pipe Gravity system with which all heating contractors are familiar. It is a policy of this Company to eliminate all of the "mystery" which has surrounded the so-called "Special Systems."

The general arrangement of valves and piping in Vapor and Vapor-Vacuum systems is similar; the only difference being in the type of Return Main Vents.

No. 10. Valves are used for venting Return Mains in Vapor Systems and No. 11 Valves in Vapor-Vacuum Installations.

DIFFERENTIAL LOOP OR WATER LINE CONTROL.

Steam connection to loop may be carried direct from the boiler, header, or steam main. It should be uncovered and at least four feet long, to supply the necessary amount of condensation to Loop. The Standard loop should not be used where distance between lowest point in the Return Main is less than 24" above the boiler water line.



C. A. DUNHAM COMPANY LIMITED

1523-41 DAVENPORT ROAD,
TORONTO, ONT.

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Several hundred installations, comprising Educational Institutions, Provincial and Dominion Government Buildings, Industrial Plants, Hospitals, Hotels and Residences, make up the scope of Dunham Systems. Particulars gladly supplied on request.

OUR AIM is three-fold: to provide first an Organization, second a Service, and third a Product, all of which will stand for and be recognized as the highest in the art of heating.

ORGANIZATION: Our Company and the Organization within it is the largest engaged exclusively in the manufacture and sale of Heating Specialties and Systems.

SERVICE: "Better and more economical heating," has been the slogan that has built our Service Department. To assist clients in the proper and best application of our products, we have a Service Department made up of a corps of Engineers as well as many Branch Sales Offices whose duty it is to keep in touch with every Dunham installation and to assist clients and customers in securing the greatest efficiency and satisfaction from Dunham Heating. Through our Branch Sales Offices and Service Department we make inspection of Dunham Heating Systems and furnish suggestions for operating, to secure best results.

We suggest that clients advise us when contemplating the use of Dunham Systems, that we may effectively render this service. We will check plans and specifications free of charge, or we will prepare heating plans and specifications of Dunham Systems for a nominal charge.

PRODUCTS.

PRODUCT: The Dunham Products are the leaders of their kind and all Dunham Specialties are made of the highest grades of suitable materials, by specially trained workmen in one of the most modern equipped plants in Canada. They are all made to a high standard and so proven by tests before shipment.

Specialties for use in connection with the Dunham Systems of Heating, known according to its several adaptable forms as follows:—The Dunham Home Heating System, the Dunham Return System and the Dunham Vacuum System, all two-pipe steam systems; and the Dunham Air Line System, a one-pipe system.

These Specialties are: The Dunham Radiator Trap; Dunham Drip Traps; Dunham Blast Trap; Dunham Packless Radiator Valve; Dunham Air Eliminator; Dunham Return Trap; Dunham Oil Separator; Dunham Suction Strainer; Dunham Reducing Pressure Valve and Vacuum Pump Governor; Dunham Air Line Valve; Dunham Return Pumps and Dunham High Pressure Bucket Steam Traps.

THE CONSULTING ENGINEER.

This is an age of specialization and a great need for economy in operation of all mechanical equipment in buildings. The most successful architects are recognizing the value of the services of reputable Consulting Engineers to handle their mechanical problems, among which might be mentioned power plant apparatus both steam and electrical, heating and ventilating equipment, plumbing and electric wiring.

The service rendered by Consulting Engineers is valuable and the fees charged are reasonable. Our organization has no service to offer outside the scope of heating, but we are ready at all times to co-operate with Consulting Engineers, Architects and Contractors, to furnish special details and information instructive as to the best way of installing and using Dunham products.

DUNHAM RADIATOR TRAP.

The simplicity of the Dunham Radiator Trap is very apparent. It comprises a body, a cover, and the thermostatic disc which is secured in the cover. There are no loose parts, no sliding contacts, and no guide or pin to obstruct the valve opening. There is a flat valve and seat with liberal valve opening. The position and design of the valve is such that it is self-cleaning. The action of the disc is positive, and the valve seats squarely, like a globe valve, the tightest of all types of valves, and one presenting little opportunity for uneven wear. The body is standardized, also the cover and disc, thus giving the further advantages of interchangeable parts.

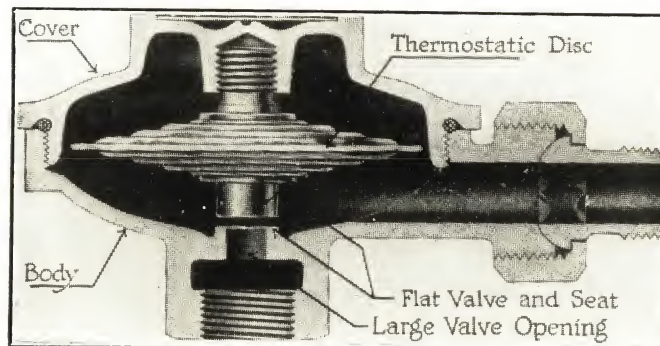
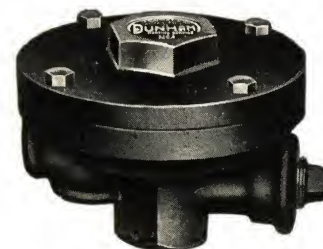
The function of the Dunham Radiator Trap is to conserve heat, and thus fuel, by keeping radiation and piping at the point of maximum efficiency. To do this the working part of the trap, the Dunham Thermostatic Disc, must be and always is fully exposed to the actual conditions within the radiation, and it therefore responds instantly to any change taking place therein, automatically releasing air and water of condensation, and closing to prevent waste of unused steam. It not only saves steam, but clears the space which should be occupied by steam from air and water—enemies of high efficiency.

This trap was the first of its kind to be a commercial success, and it has maintained its leadership since 1903. It has therefore stood the test of time. It is made in 5 sizes, and for steam pressures not to exceed 10 lbs. gauge.

See Dunham Bulletin No. 101 for full description and application.

CAPACITIES
DUNHAM RADIATOR AND DRIP TRAPS.
FOR PRESSURES NOT EXCEEDING 10 LBS. GAUGE.

Size.	Pipe Connections.	Weight.	Cap. Sq. Ft. Radiation.
No. 1...	1/2"	26 oz.	100
No. 2...	1/2"	46 oz.	350
No. 3...	3/4"	53 oz.	400
No. 4...	3/4"	12 1/2 lbs.	1500
No. 5...	1"	21 lbs.	3000



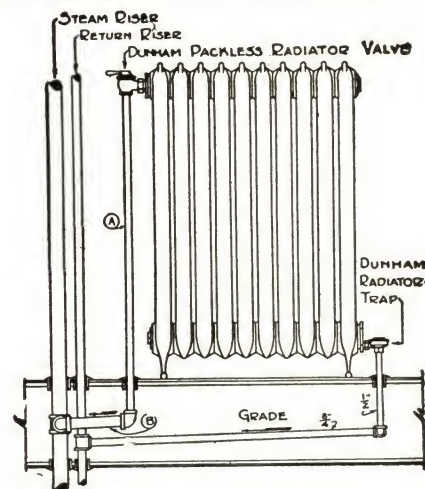
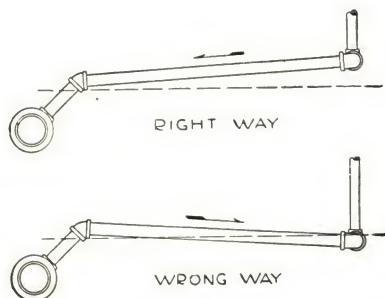
RADIATOR CONNECTIONS.

The size of radiator connections for Dunham Systems is shown here—when supply is at top of Radiator:—

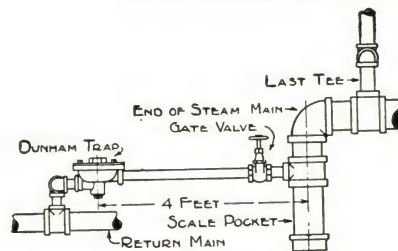
Sq. Ft. Radiation.	Inlet.	Return.
1 to 40	$\frac{1}{2}$ "	$\frac{1}{2}$ "
41 to 100	$\frac{3}{4}$ "	$\frac{1}{2}$ "
101 to 180	1"	$\frac{1}{2}$ "
181 to 250	$1\frac{1}{4}$ "	$\frac{1}{2}$ "

SPRING CONNECTIONS.

The importance of having proper grade in spring connections between steam main and riser and between riser and radiator cannot be impressed too strongly. Care must be used to avoid pockets when expansion in risers occur, if free, unobstructed circulation is to take place. See detail below.



DETAIL No. 1.—Showing Top Supply Connection to Radiator as used in Dunham System of Heating.



DETAIL No. 2.—Showing method of Draining End of Steam Main when Return Line is below Steam Main.

DUNHAM BLAST TRAP.

The Dunham Blast Trap, shown here, is a trap of capacity large enough to drain Blast Heating Coils. Thousands of them are in use in all parts of the country. This trap operates upon precisely the same principle as the Dunham Radiator Trap. In fact, it is a large Dunham Radiator Trap with body made of cast iron, instead of bronze. The working parts are made of the same material as the working parts of the Dunham Radiator Trap.

CAPACITIES.

FOR PRESSURES NOT EXCEEDING 10 LBS. GAUGE.

No.	Size.	Pipe Connection.	Capacity Sq. Ft. of Direct Rad.	Weight, Pounds.
6	$\frac{3}{4}$ "	$\frac{3}{4}$ "	1,500	12½
7	1"	1"	3,000	21

Be sure and reduce blast surface to equivalent direct radiation, by multiplying the actual surface of the coil by a factor ranging from 3 to 9, depending upon the temperature and volume of the air that is blown over the coils.

These traps can be installed either angle or straightway. Only made for pressures up to 10 lbs.

See Dunham Bulletin No. 102 for full description.

DUNHAM AIR LINE SERVICE VALVE.

Principle of operation is identical, and design similar, to the Dunham Radiator Trap. Its efficiency is high, and service in connection with air line systems is invaluable. This is for one-pipe steam system using a Dunham air line valve on each radiator in place of the usual sputtering air valve, with a system of air line piping which may discharge the air by gravity or be attached to a suitable air line vacuum pump. This system is particularly adaptable in making old one-pipe heating systems more efficient. It is easily and cheaply installed, and insures the quick removal of air from the radiators. Valves can be furnished with $\frac{1}{8}$ " radiator connection.

See Dunham Bulletin No. 107 for description and application.

DUNHAM PACKLESS RADIATOR VALVE.

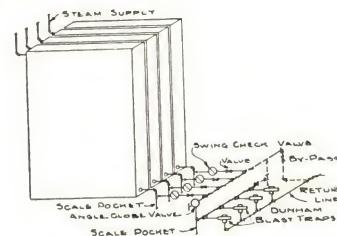
This is a bona-fide packless radiator valve and not one dependent upon springs and packing rings. The Dunham disc makes this possible. It has a low bonnet and stem and unusual lines, making it attractive in appearance. The valve can be opened or closed in seven-eighths of a turn. It is made only in the angle pattern for use in a top radiator connection. Sizes and capacity for direct cast iron radiation: $\frac{1}{2}$ "—40 ft.; $\frac{3}{4}$ "—41 to 100 ft.; 1"—101 to 180 ft.; $1\frac{1}{4}$ "—181 to 250 ft. Packless valves are required in all vacuum heating work.

See Dunham Bulletin No. 104 for description.

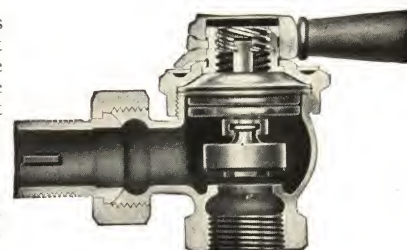
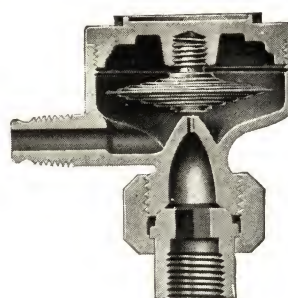
USING DUNHAM PRODUCTS.

The Dunham system of heating may be further described in its several adaptable forms to peculiar conditions by the following sub-names: The Dunham Home Heating System, as its name implies, for the home or small building. The Dunham Return System, for the medium size building, the apartment house, the small school, factory, and church, also for changing over and increasing the efficiency of old one-pipe and two-pipe gravity steam jobs. The Dunham Vacuum System for still larger buildings of all types, for groups of buildings, factories, schools, colleges, hospitals, and for municipal or central heating plants.

Each of these several designs are complete two-pipe systems, the great efficiency of which is made possible by the use of the Dunham Radiator Trap, which is installed at the discharge or return outlet of each radiator or pipe coil, where it stands guard against the waste of steam and constantly relieves the radiation of the enemies of heating efficiency—air and water.



DETAIL No. 3.—Showing Method of Applying Dunham Blast Traps to Blast Heaters.



DUNHAM HOME HEATING SYSTEM.

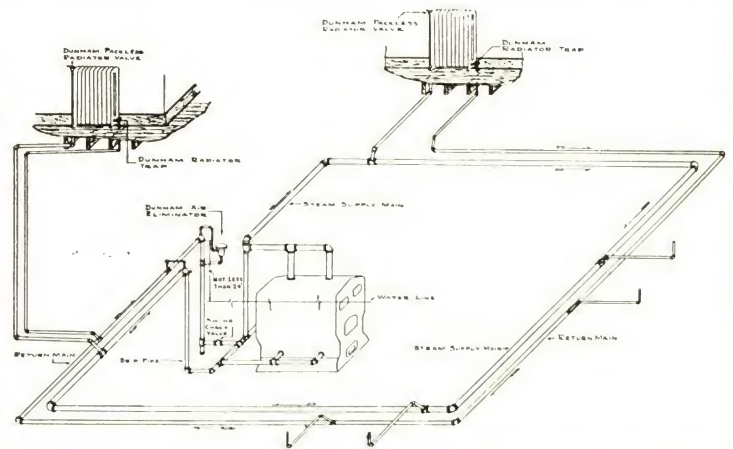
No system could be more simple in arrangement and design, or more easy or efficient in operation. Steam at a pressure not exceeding 8 oz. is used: it leaves the boiler and passes through liberal sized, though not large, steam piping and through Dunham Packless Radiator Valves to each radiator, where it is retained by the Dunham Radiator Trap until it has given off its heat, when, as water, it passes through the trap together with the air (no sputtering, leaky, "abominable" air valves are used on the radiators) and back to the boiler through the return piping, the air being freed through the Dunham Air Eliminator, and the water returning back into the boiler without the use of any mechanical device.

The end of each steam main is vented through a Dunham No. 1 Radiator Trap into the return piping and is dripped through a wet drip line directly back to the boiler. All radiators used shall be of hot water pattern with top inlet and bottom outlet connections.

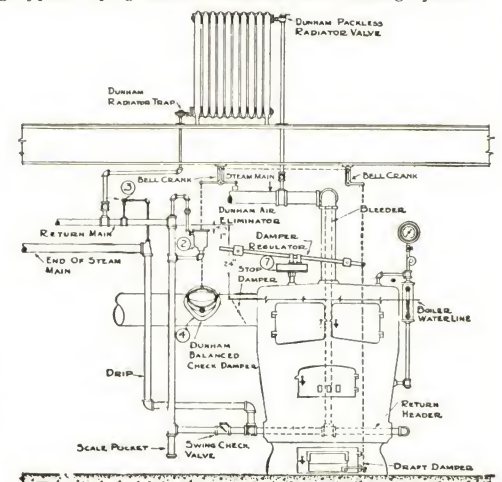
The high efficiency of operation is obtainable because of the opportunities for effective steam distribution, and this is assisted by the Dunham Damper Regulator effectively controlling the steam pressure on the boiler.

Specify the Dunham Home Heating System using Dunham Packless Radiator Valves and Dunham Radiator Traps in supply and return connection to and from each radiator, Dunham Air Eliminator to release the air, and Dunham Damper Regulator to control dampers: each and all to be installed in accordance with instructions and standard detail drawings to be supplied by the C. A. Dunham Co. Ltd.

See Dunham Bulletin No. 108 for full description and application.



DETAIL No. 8.—Showing Typical Piping Plan of Dunham Home Heating System.



DETAIL No. 9.—Showing Typical Boiler Piping and Connections, Dunham Home Heating System.

HOW TO SPECIFY.

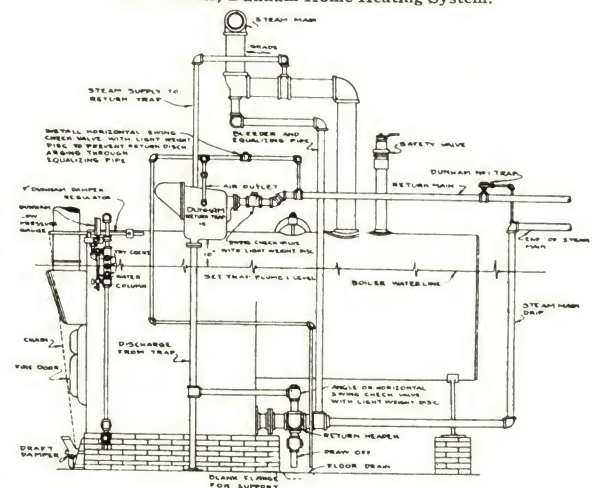
DUNHAM RETURN SYSTEM.

This system comprises the simplicity in arrangement and design now so well known in the Home Heating System, and it is accompanied by the same opportunity for maximum efficiency. It differs from the Home Heating System in that it makes use of the Dunham Return Trap, or a Dunham Automatic Return Pump to replace the Air Eliminator, which introduces the added feature of a positive automatic return of water to the boiler when desired to raise steam pressure.

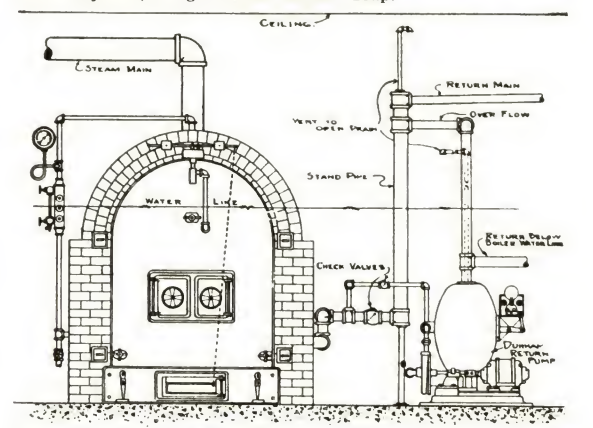
The feature of a positive return under varying steam pressures makes this Dunham system particularly adaptable to apartment houses, small hotels and medium-sized commercial buildings, schools and churches. Above all, however, this system makes possible the modernizing of old one-pipe and two-pipe gravity flow systems, materially increasing their efficiency by the introduction of the Dunham Radiator Trap at each radiator, insuring a positive circulation without loss of steam, and permitting the removal of all sputtering, leaking air valves which are such trouble-makers in these old heating jobs. During these days when conservation of fuel is of such great importance, this system presents the greatest opportunity for the most efficient and effective use of steam for heating purposes, and therefore will be a fuel saver.

Specify the Dunham Return System using Dunham Packless Inlet Valves connected at top of hot water type radiators and Dunham Radiator Traps at return end of radiators and Dunham Return Trap or Return Pump for releasing air and returning water to the boiler: each and all to be installed in accordance with instructions and standard detail drawings to be supplied by the C. A. Dunham Co. Ltd.

See Dunham Bulletin No. 109 for full description and application.



DETAIL No. 6.—Showing typical Boiler Connections for Dunham Return System, using Dunham Return Trap.

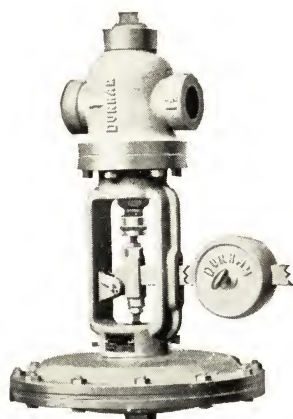
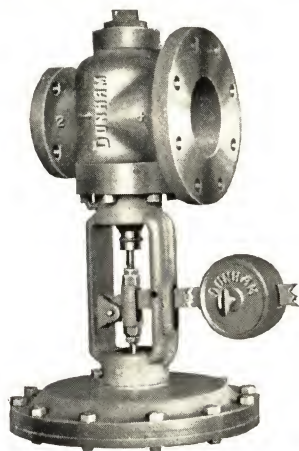


DETAIL No. 7.—Showing typical Boiler Connections for Dunham Return System, using Condensation Pump.

HOW TO SPECIFY.

DUNHAM REDUCING PRESSURE VALVE

The Dunham Reducing Pressure Valves are provided with Double Balanced Valves, and seats of special Phosphor Bronze and are applicable to a wide range of pressures and are very sensitive in meeting sudden demands. The expanded outlet type of valves is particularly applicable to heating service or other conditions where high initial pressure is to be reduced to a very low pressure.



TYPE R.L.P.

DUNHAM RETURN PUMP.

The function of the Dunham Return Pump is the automatic return of condensate from the heating system to the boiler.

The Type R.L.P. units are provided for low pressure service not exceeding total head at pump of 20 pounds gauge. The Type R.H.P. units are suitable for pumping against greater heads when required for boiler feeding. The capacity of the units depending on the head pumped against.

The units are simple and fool-proof and embody best possible material and workmanship. They consist of a centrifugal pump direct connected to electric motor, mounted on cast iron base. Receiver is equipped with float controlled switch for "stopping" and "starting" the motor.

The switch is enclosed, of sliding contact type, and controls motor selected for this particular service. It is approved by the Ontario Hydro Power Commission, Laboratory License No. 361. Standard units are equipped with motors 110-220 volts, single phase, alternating current. Motors for other current can be supplied to conform to specification.

SPECIFICATION.

Pump No.	Type.	Capacity Sq. Ft. Direct Radiation.	Motor. Single Phase.	Speed.	Max. Lbs. Discharge Pressure.
25	1" R.L.P.	1,000 to 16,000	1 H.P. 25 cycle	1450	20
26	1" R.L.P.	1,000 to 16,000	1 H.P. 60 cycle	1750	20
27	1 1/4" R.L.P.	16,000 to 30,000	1 1/2 H.P. 25 cycle	1450	20
28	1 1/4" R.L.P.	16,000 to 30,000	1 1/2 H.P. 60 cycle	1750	20
31	3/4" R.H.P.	2,000	1/4 H.P. 25 cycle	1450	40
32	3/4" R.H.P.	3,500	1/4 H.P. 60 cycle	1750	40
33	3/4" R.H.P.	4,000	1/2 H.P. 25 cycle	1450	40
34	3/4" R.H.P.	6,000	1/2 H.P. 60 cycle	1750	40
35	1" R.H.P.	7,500	1 H.P. 25 cycle	1450	40
36	1" R.H.P.	10,000	1 H.P. 60 cycle	1750	40
37	1 1/4" R.H.P.	18,000	1 1/2 H.P. 25 cycle	1450	40
38	1 1/4" R.H.P.	24,000	2 H.P. 60 cycle	1750	40

Ratings are based on 1/4 lb. of condensate per square foot of direct radiation when pump is operating against maximum discharge pressure, (which includes friction in pipes, boiler pressure etc.)

All units supplied complete with motors and arranged for cutting in directly across the line. Hand switch with fuses should be installed to cut off power from unit.

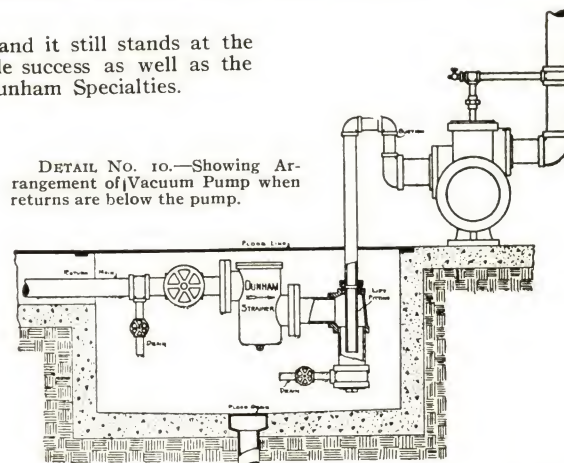
Since 1903 the Dunham Vacuum System has been a leader, and it still stands at the front, easily maintaining its position because of the remarkable success as well as the high efficiency of the Dunham Radiator Trap and allied Dunham Specialties.

Simplicity again is the leading note of Dunham design. There is the system of steam mains and piping to supply all radiation, and the return piping to carry away the air and water of condensation. Steam may be supplied direct from boiler plant, or through pressure reducing valve where boiler pressure is too high (over 10 lbs. gauge) for direct service, or exhaust steam may be used, supplemented by live steam through a reducing valve.

The returns all converge and grade to the suction inlet of a vacuum pump, which may be either steam or motor driven, automatically controlled, and which may also act as a boiler feed pump. Where exhaust steam is used or where boiler pressure exceeds 10 lbs., the discharge from the vacuum pump should go to a freely vented automatic receiver of a boiler feed pump, the vacuum pump not being used directly to feed the boiler.

Specify the Dunham Vacuum System using Dunham Packless Radiator Valve and Dunham Radiator Trap in the supply (at top) and return (at bottom) connections to and from each radiator (of hot water type), Dunham No. 3, 4 or 5 Traps for dripping risers and mains. Dunham Blast Traps for all Blast Coils. Dunham Pressure Reducing Valves for reducing the steam pressure or automatically supplementing exhaust steam, Dunham Oil Separator for removing oil from exhaust steam, Dunham Strainer for keeping dirt and scale from vacuum pump. Dunham Vacuum Pump Governor for automatically starting and stopping the steam-driven vacuum pump to maintain desired amount of vacuum in return piping: each and all to be installed in accordance with instructions and standard detail drawings to be supplied by the C. A. Dunham Co. Ltd.

See Dunham Bulletin No. 110 for full description and application.



DETAIL NO. 10.—Showing Arrangement of Vacuum Pump when returns are below the pump.

DUNHAM VACUUM SYSTEM.

HOW TO SPECIFY.

LA COMPAGNIE C. A. DUNHAM LIMITÉE

DESSINATEURS DES SYSTÈMES COMBINÉS POUR CHAUFFAGE ET VENTILATION,

904 NEW BIRKS BUILDING, MONTRÉAL, P.Q.

SUCCURSALES:

HALIFAX.

OTTAWA.

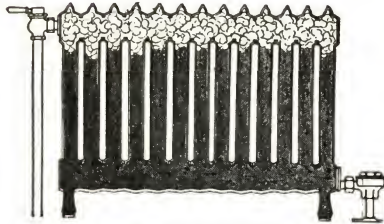
TORONTO.

WINNIPEG.

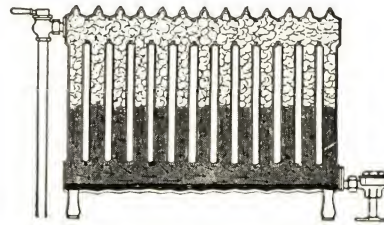
VANCOUVER.

CALGARY.

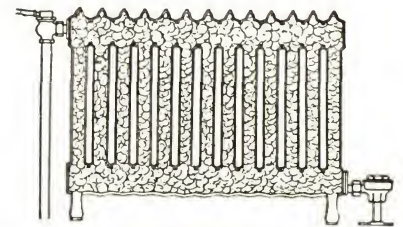
Les appareils Dunham sont de fabrication canadienne.



La vapeur entre et l'air passe à travers la trappe



La vapeur pénètre de plus en plus, l'air et l'eau s'échappent par la trappe.



La vapeur remplit le radiateur et y est retenue par la trappe.

ECONOMIE.



LE CHATEAU FRONTENAC, QUÉBEC.
Chauffé par le système Dunham.

Il faut économiser le combustible—et cependant notre climat rigoureux exige une chaleur comparativement élevée durant les longs mois d'hiver.

La seule solution parfaite à ce problème du chauffage, c'est d'employer l'un des systèmes de Dunham, à basse pression de vapeur, car ils sont à la fois hygiéniques et économiques, et de plus, ils sont installés partout pour un prix très accessible.

Ces systèmes ne possédant aucunes soupapes d'air sur les radiateurs et les tuyaux, le danger constant que l'eau puisse couler et endommager l'ameublement se trouve par le fait même éliminé. Un autre des grands avantages offerts par les systèmes Dunham, c'est leur fonctionnement tout à fait silencieux—le bruit dans les tuyaux est entièrement supprimé.

La circulation se fait rapidement avec une température uniforme, et une très douce chaleur. Toute la vapeur est conservée dans les radiateurs que ceux des systèmes de chauffage à eau peut même fermer les radiateurs dans les

jusqu'à condensation. Nos tuyaux sont plus petits que ceux des systèmes de chauffage à eau chaude. Les tuyaux et les radiateurs *ne peuvent geler*; on peut même fermer les radiateurs dans les chambres inoccupées sans aucun danger qu'ils gèlent, car la condensation quitte le radiateur aussitôt qu'il est fermé.

Les systèmes Dunham sont à deux tuyaux dont l'un alimente de vapeur les radiateurs; l'autre est un tuyau de retour. Une trappe Thermostatique Dunham est placée entre le radiateur et le tuyau de retour.

Les trappes Thermostatique Dunham permettent l'éjection de l'eau et de l'air du radiateur, tout en empêchant la vapeur de s'échapper.

Le système de chauffage par le vide Dunham fonctionne parfaitement avec une pression d'une livre et même d'une demie livre de vapeur. C'est un système idéal pour les édifices publics, hôpitaux, écoles et autres édifices se servant d'un système central de chauffage.

Le système de chauffage par vaporisation de Dunham fonctionne avec quelques onces de vaporisation—c'est un système parfait pour résidences privées, bureaux, églises, etc.

Les systèmes Dunham peuvent combiner le chauffage et la ventilation. Ils sont en conséquence hautement recommandés pour les écoles, collèges, couvents, salles publiques, clubs, théâtres, églises et hôpitaux.

La Compagnie C. A. Dunham Limitée possède des ramifications dans sept grands centres canadiens, ce qui permet d'assurer l'installation parfaite des systèmes Dunham et leurs inspections régulières subséquentes. Notre personnel d'ingénieurs experts fournira tous les renseignements que vous puissiez désirer concernant les divers appareils Dunham et vous avisera sur le type de chauffage qui répondra le mieux à vos besoins; que la construction à chauffer soit une résidence, une école ou un édifice public.

TRAPPES THERMOSTATIQUE DUNHAM.

SYSTEMES DE CHAUFFAGE PAR LE VIDE DUNHAM.

SYSTEME DE CHAUFFAGE PAR VAPORISATION DE DUNHAM.

SERVICE.



L'EDIFICE DRUMMOND, MONTRÉAL.
Chauffé par le système Dunham.

FONCTIONNEMENT.

MISE EN MARCHE.

La Trappe Dunham donne au radiateur son maximum d'efficacité calorifique: elle permet à l'air et à l'eau de s'échapper du radiateur alors que seule y reste la vapeur.

Lorsque la Trappe Dunham est installée, le Disque Thermostatique est sujet aux mêmes conditions de pression et de température que l'intérieur du radiateur et son travail se fait dans ces conditions.

En pénétrant dans un radiateur froid, la vapeur chasse l'air froid à travers la Trappe dans le tuyau de retour. En chauffant le radiateur, la vapeur perd de sa chaleur et de ce fait, se recondense à l'état d'eau. L'eau plus lourde que la vapeur, coule au fond du radiateur, revient au Trappe et de là, dans le tuyau de retour.

Après avoir chassé l'air la vapeur remplit le radiateur et suit l'eau jusqu'au Trappe qui, au contact de la vapeur plus chaude que l'air et l'eau se ferme automatiquement. La chaleur de la vapeur vaporise le liquide contenu dans le disque et qui, en se gazéifiant, dilate celui-ci, fermant la valve qu'une puissante pression maintient sur son siège. La vapeur reste donc tout entière dans le radiateur.

Le radiateur complètement rempli de vapeur répand de la chaleur, condense la vapeur uniformément. L'eau coule régulièrement vers la Trappe qu'elle refroidit quelque peu, ce qui est suffisant pour le faire s'ouvrir et permettre à l'eau de passer.

MARCHE NORMALE.

Le contact alternatif de la vapeur et de l'eau aurait pour effet d'ouvrir et fermer la Trappe par saccades. En réalité l'ouverture et la fermeture se règlent lentement à la façon d'un thermomètre qui s'adapte à la température ambiante. L'écoulement d'eau devient alors continu et tel que l'eau ne reste pas en contact avec la surface radiante, mais que la vapeur ne peut passer.

INSTALLATION.

Les Trappes Dunham et le système de chauffage Dunham qui s'adapte si parfaitement à n'importe quel genre de bâtiment quelle que soit son importance, peuvent être installés par n'importe quel entrepreneur de chauffage compétent. Elles sont préconisées par les premières maisons spécialistes en matériel pour les installations de chauffage.

Il est important dans les installations comportant des Trappes Dunham de donner la pente nécessaire aux tuyauteries en général ainsi qu'aux tubes allant aux trappes. La tuyauterie doit être sans irrégularité de niveau et sans poches. L'efficacité des Trappes Dunham se maintient si cette règle est observée l'existence de poches d'eau rend la circulation de vapeur imparfaite.

EMPLACEMENT DES TRAPPES.

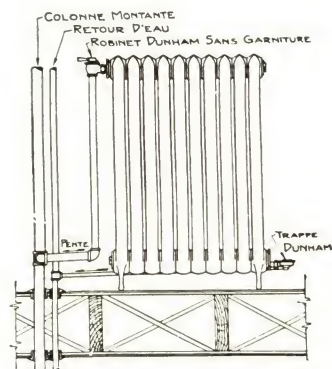
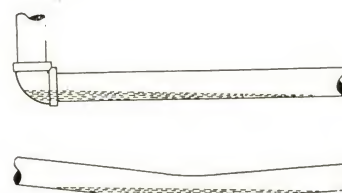
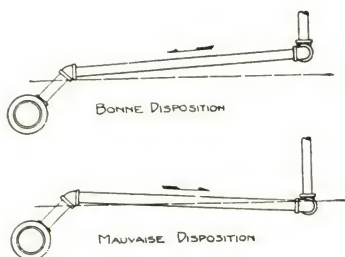
Les illustrations ci-contre montrent diverses méthodes d'installation des trappes sur les radiateurs. Les raccords de tuyauterie pouvant être faits au-dessus ou au-dessous du plancher ou dans son épaisseur même. Les trappes du modèle d'équerre avec les raccords appropriés sont préférables, quoique la Trappe Dunham puisse être livrée en modèle d'angle et en modèle droit, si c'est nécessaire. Les robinets d'admission seront montés de préférence à la partie supérieure des radiateurs qu'il est recommandable de choisir du type à eau chaude, c'est-à-dire à double connexion.

Dans le cas où il s'agit de purger des canalisations de vapeur vive, il est recommandé de monter l'appareil à l'extrémité d'un tuyau de 4 pied de longueur environ et d'aménager une poche à l'extrémité de la tuyauterie pouvant recueillir les impuretés. L'emploi d'une valve est également indiqué sur ce dernier dispositif.

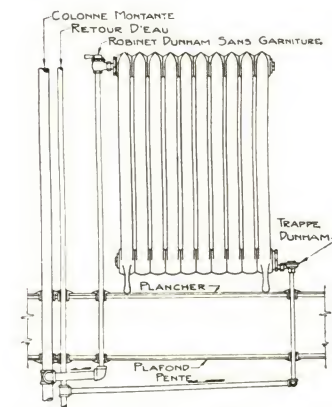
Lorsque la trappe est employée à l'extrémité d'une canalisation principale, celle-ci devra être prolongée et munie d'une poche pour recueillir les impuretés. Les Trappes Dunham Nos. 4 et 5 sont généralement recommandées dans ce cas. Une montée ou dos d'âne dans une conduite principale est purgée comme il est montré ci-contre.

La colonne montante branchée sur une conduite principale se trouvant au-dessus exige une trappe particulier, celui-ci est alors installé comme le montre notre croquis. La Trappe No. 3 est préférable pour ce service à condition toutefois qu'il soit assez puissant.

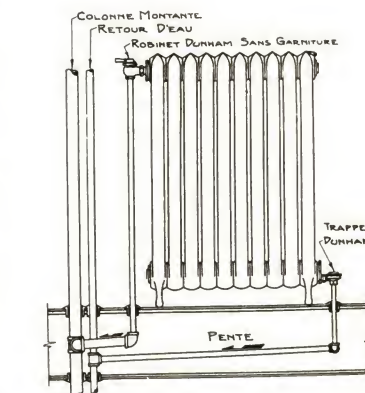
Les Trappes Nos. 1 et 2 sont recommandées pour l'emploi sur radiateurs et ne sont pas conçus pour le service des tuyauteries d'écoulement ou des tuyauteries importantes.



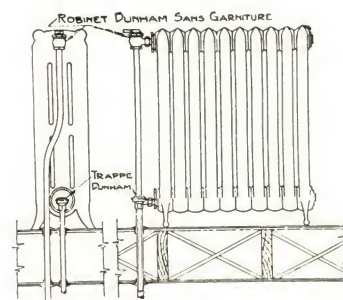
RACCORD FAIT AU-DESSUS DU PLANCHER.



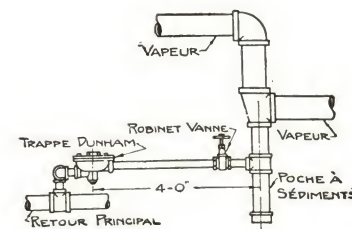
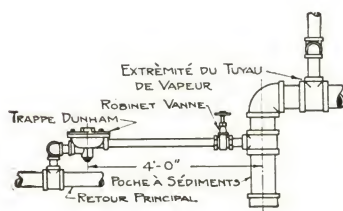
RACCORD FAIT AU-DESSOUS DU PLANCHER.



RACCORD FAIT DANS L'ÉPAISSEUR DU PLANCHER



ROBINET ET PURGEUR PLACÉS DU MÊME CÔTÉ.



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HEALY-RUFF COMPANY

MANUFACTURERS E-Z RADIATOR HANGERS.

MINNEAPOLIS, MINN.

"MANUFACTURED IN CANADA"

GUELPH, ONT. AND WINNIPEG, MAN.

CANADIAN PATENT No. 196356

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PRODUCT.

E-Z ONE BOLT RADIATOR HANGER OR BRACKET, both styles adapted for hanging all makes and sizes of radiators on the wall. "Made in Canada."

STYLES.

Style "H" places Radiator $2\frac{1}{2}$ " from wall and provides for baseboard adjustment.

Style "R" places Radiator $1\frac{1}{2}$ " from wall, but is not adjustable for baseboard.

ADVANTAGES.

The wall is the logical place for radiation. When a radiator is hung on the wall it offers no obstruction when cleaning floors, carpets or rugs.

Appearance, convenience, increased floor space and decreased installation cost demand the use of E-Z Radiator Hangers.

E-Z Radiator Hangers are the result of careful study, are designed by skilled engineers (mechanically perfect, positive in measurement).

The E-Z Radiator Hangers are adapted to any type of construction, whether concrete, brick, hollow tile, gypsum block or frame wall.

Anchor bolts may be set during progress of construction, without accurate measurement, radiators can be hung, all connections made, system tested and bronzed before floors are laid, thus effecting a considerable saving in installation cost.

E-Z Radiator Hangers are designed for all wall and column radiation, are self-adjusting to expansion, are provided for vertical and horizontal adjustment, and require but one anchor bolt for each hanger. Temperature control valves can be used. Entire hanger invisible, including upper support washer.

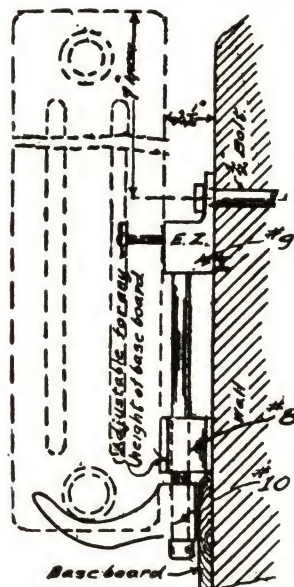
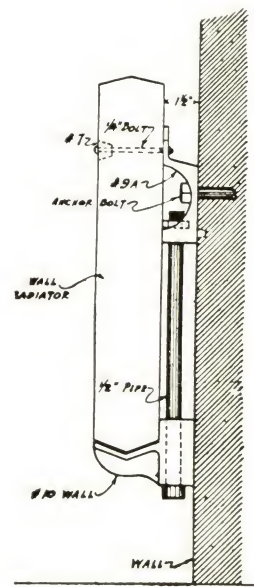
TYPICAL SPECIFICATIONS.

Where Baseboards are used.—All radiation, unless otherwise noted, shall be supported on wall by means of E-Z Radiator Hangers Style "H" or equal and approved in writing by the Architect, arranged to support the radiator $2\frac{1}{2}$ inches from the wall and with baseboard adjustment.

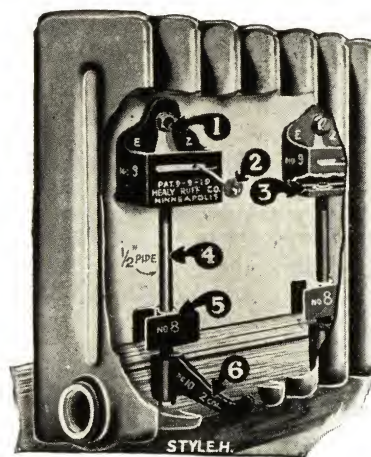
Where Baseboard Adjustment is Not Desired.—All radiation unless otherwise noted shall be supported on wall by means of E-Z Radiator Hangers Style "R" or equal and approved in writing by the Architect, arranged to support the radiator $1\frac{1}{2}$ inches from the wall.



STYLE "R" RADIATOR HANGER

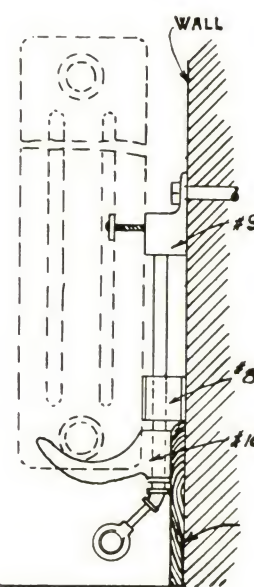


NOTE BASEBOARD ADJUSTMENT



1. One Bolt
2. Invisible Washer
3. Horizontal Adjustment
4. Vertical Adjustment
5. Adjustable for Baseboard
6. Made for Wall, and Column Radiation

STYLE "H" RADIATOR HANGER



E-Z METHOD OF HANGING RETURNS

THE KERR ENGINE COMPANY, LIMITED

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PRODUCTS.

We manufacture a strictly high-grade line of RENEWABLE DISC BRASS GLOBE AND ANGLE VALVES; BRASS STEAM AND HOT WATER RADIATOR VALVES; BRASS AND IRON BODY GATE VALVES; IRON BODY SWING CHECK VALVES; INDICATOR POSTS; FIRE HYDRANTS; WATER CRANES, Etc.

CATALOGUE.

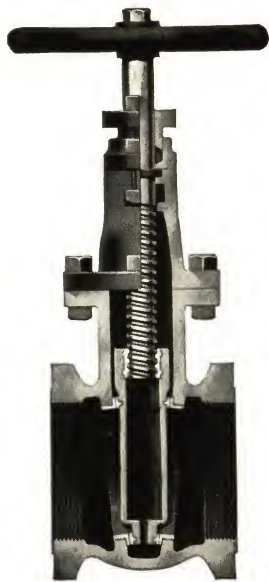
Our list of manufactures is so varied that it would be useless to attempt a general description of each, but our Catalogue No. 5 is very complete, and will, we believe, convey to anyone most of the information necessary, and we suggest that you write us for one or more copies at once. It is a small catalogue, well illustrated with half-tones, and should be on your files.

OUR HOME AND WORKSHOP.

Established here since 1874.



WORKS AT WALKERVILLE, ONTARIO.



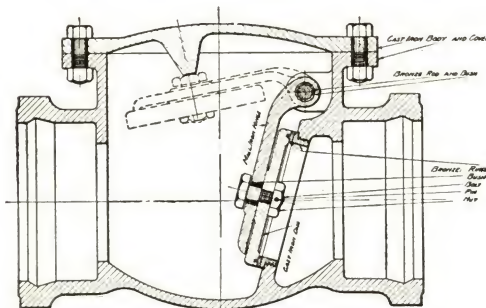
No. 59.
NON-RISING STEM "KEYSTONE"
GATE VALVES.



No. 87.
APPROVED
INDICATOR POST
AND GATE VALVE.
(UNDERWRITERS.)



BRASS "WEBER"
GATE VALVES.



CROSS SECTION.
UNDERWRITERS' APPROVED
SWING CHECK VALVES.



No. 62.
APPROVED O. S. & Y. GATE VALVES.
(UNDERWRITERS.)



RADIATOR VALVES.

Handled by all representative dealers, and used by the leading steam and hot-water fitters.

Write us to-day for our Catalogue No. 5, which will give full information and good detailed illustrations.

CRANE LIMITED

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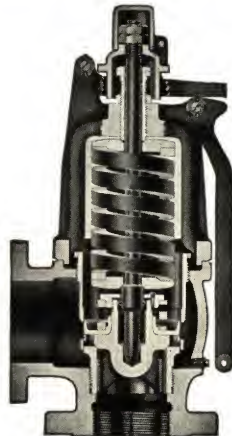
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WE SUPPLY CAST IRON FITTINGS, SCREWED AND FLANGED; MALLEABLE IRON FITTINGS, CAST STEEL FLANGED FITTINGS, FORGED STEEL SCREWED FITTINGS AND FLANGES; UNIONS AND FLANGE UNIONS—ALL IRON; BRASS TO IRON AND ALL BRASS; BRASS FITTINGS, SCREWED AND FLANGED DRAINAGE FITTINGS; BRASS, IRON AND STEEL VALVES FOR ALL PRESSURES AND PURPOSES; POWER PLANT EQUIPMENT; PIPE BENDS; FLANGED AND SCREWED PIPE, STEAM SPECIALTIES, PLUMBING AND HEATING MATERIAL.

CRANE IRON BODY POP SAFETY VALVES.



No. 1117 FLANGED.
No. 1116 SCREWED.
IRON OR STEEL—1½" TO 4½".

CRANE IRON BODY POP SAFETY VALVES.

Have a patented self-adjusting auxiliary disc and spring, operating entirely independently of the main disc and spring.

This device automatically regulates the blow back of the valve within certain limits and combines the following qualities:—

- High Discharging capacity.
- Small blow-down of pressure.
- Minimum waste of steam.
- Absence of wire drawing at the seat.
- Prompt seating without hammering.



No. 1101

CRANE "Y" PATTERN AUTOMATIC STOP-CHECK VALVES, EXTRA HEAVY.

CRANE "Y" PATTERN AUTOMATIC STOP-CHECK VALVES, EXTRA HEAVY.

Straight and Angle Pattern—Sizes 2½ to 10 inches.

All steam plants having more than one boiler should have one of these combination stop-check valves in the piping, between each boiler and the main steam line or header.

In the event of a tube blowing out, or the bursting of a joint in the boiler lead to which a stop-check valve is connected, the valve will instantly and automatically close, cutting out the boiler, and acting as a non-return valve, preventing a back flow of steam from the main.

They also act as a safety stop valve, preventing any steam entering or backing into a closed boiler while men are at work inside.

Disc and Piston in one piece.

Liner or Stem cannot be cramped by pulling up yoke bolts.

Readily removable seat, which is integral with the liner or dash pot.

Disc may be reground readily.

Deep throttling lip to prevent chatter on light loads.

45° angle of disc eliminates chattering.

Full length bearing of disc in liner.

Will operate in vertical or horizontal position.



No. 30E.
AUTOMATIC STOP-CHECK VALVE.
IRON OR STEEL—2½" TO 10".

CRANE EXTRA HEAVY BLOW-OFF VALVES.

We recommend these valves for use as blow-offs on high pressure boilers and all other purposes where it is desirable to blow off dirty water, or water containing grit or sediment, under pressure.

This service, therefore, requires a valve which can be repaired quickly and cheaply. To prevent too frequent repairing we make these valves with a removable iron seat ring, having the seating surface on the outside of the ring. This disc is also made of iron.

This construction prevents scale from lodging between the seat and disc. The use of iron for this service in the seat and disc is the result of many years' experience with valves of this type.



No. 393

CRANE EXTRA HEAVY ALL-IRON BLOW-OFF COCKS.

No. 317.
ALL-IRON BLOW-OFF COCK.
1" to 2 1/2".

CRANE EXTRA HEAVY ALL-IRON BLOW-OFF COCKS.

SCREWED AND FLANGED.

With compensating spring.

250 pounds steam working pressure.

The compensating spring, which is located between the plug and the cap, automatically takes up wear and holds the plug securely in place at all times, thereby preventing the accumulation of scale, sediment, etc., which would tend to impair the ground bearing surfaces of the plug and body.

CRANE PRESSURE REGULATORS.

CRANE PRESSURE REGULATORS.

For saturated steam or air working pressures up to 250 pounds.

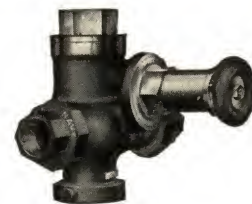
Sizes 1/2" to 8".

Wherever it is necessary or desirable to reduce the pressure of steam or air, a Crane Pressure Regulator should be used, because they are designed particularly to give accurate automatic pressure regulation. Our regulators are recommended because they possess the following features: Reliability, wide range of variation in reduced pressure, simplicity of operation, accessibility for inspection, convenience in making repairs.

Crane Pressure Regulators are adapted for use with steam heating systems, vulcanizers, cookers, paper machines, engines, pumps, turbines, dryers, various industrial processes, air tools, blasts, heaters of various kinds, etc.

Crane Pressure Regulators should be specified according to capacity—not pipe sizes.

Send for circular No. 126.

No. 962.
C.C. PRESSURE REGULATOR.

CRANE STEAM AND OIL SEPARATORS.

CRANE STEAM AND OIL SEPARATORS.

OIL SEPARATORS.

For steam working pressures up to 25 pounds.

STEAM SEPARATORS.

STANDARD.—For steam working pressures up to 125 pounds.

EXTRA HEAVY.—For steam working pressures up to 250 pounds.

CAST STEEL.—For superheated steam working pressures up to 350 pounds and a total temperature of 800° Fahrenheit.

The design of Crane Separators is based upon the most approved and scientific principles.

We do not hesitate to offer this superior line of Separators in competition with any steam or oil separating devices on the market.

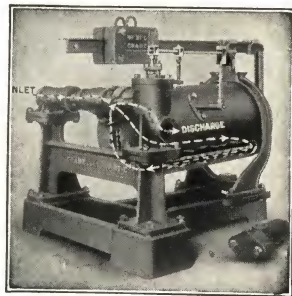
They have large areas and ample baffling surfaces, affording the highest degree of efficiency with the slightest loss in pressure.

Condensation in steam is dangerous—it has no power value and reduces engine efficiency.

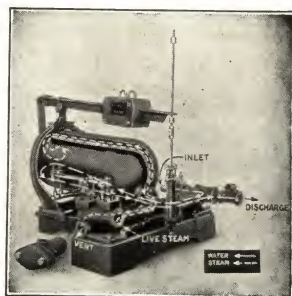
To obtain the best results from any Separator it must be properly drained.

No. 011.
HORIZONTAL.No. 03.
LOW PRESSURE OIL
SEPARATOR.

CRANETILT STEAM TRAPS. PATENTED.



NON-RETURN



DIRECT RETURN.

CRANETILT STEAM TRAPS. PATENTED.

NON-RETURN, DIRECT RETURN, THREE VALVE
LIFTING AND VACUUM.

Will work on pressures up to 250 pounds per square inch.

Cranetilt Steam Traps Save Coal.

Cranetilt Steam Traps will handle condensation from all sources and conditions of service, and under any pressure of steam up to 250 pounds. Their discharging capacities are much greater than any other style tilt trap now on the market.

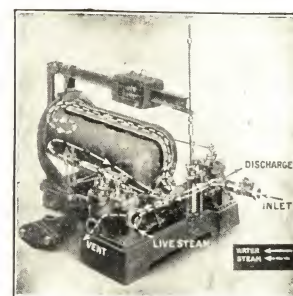
The Direct Return will automatically return all condensations, at any pressure or temperature, directly back to the boiler. Made in sizes $\frac{1}{2}$ to 4 inches, capacities up to 28,000 pounds of water per hour.

Cranetilt Three Valve Lifting Traps are designed to be used as Lifting, Vacuum or Metering Traps. Made in sizes $\frac{1}{2}$ to 4 inches, capacities up to 28,000 pounds of water per hour.

Cranetilt Non-Return Traps will handle ten times more water than bucket, pot or float traps having equal size pipe connections. Made in sizes $\frac{1}{4}$ to 3 inches, capacities up to 112,500 pounds of water discharged per hour.

Cranetilt Traps have no internal working parts. The discharge valve is on the outside, easily accessible and simple in construction, and has an area 50% greater than the area of the inlet pipe.

Specify Steam Traps on their discharging capacities—not by pipe sizes. Our Engineers are always at your service on any condensation problem.



THREE VALVE LIFTING.

CRANE PIPE BENDS ARE THE STANDARD.

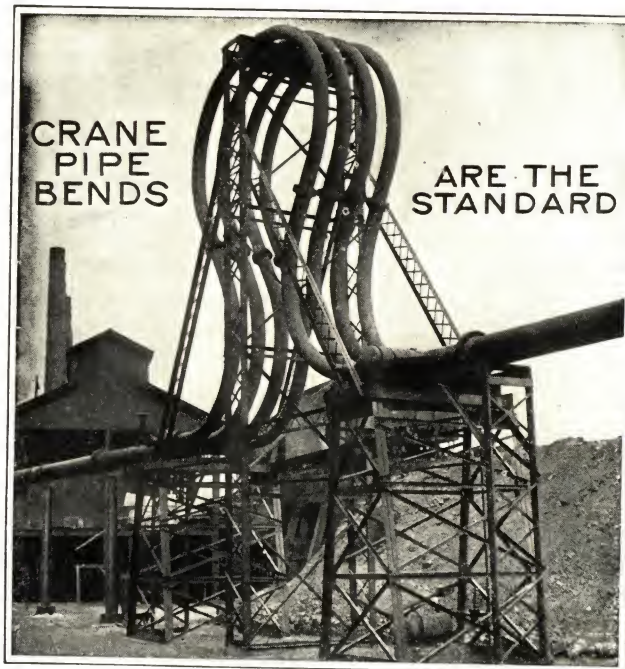
A Crane Pipe Bend is exact to the number of degrees specified and flanges are made on at 90 degrees to the axis of the pipe in the tangent, so that it is not necessary to force a Crane Bend into position.

There is more to a pipe bend than just the plain process of bending a piece of pipe. After the customer has gone to the expense of having a pipe bent, he gets much more for his money if the bend is made to proper radius, proper tangents, and arranged to take care of required expansion. Sometimes it is possible to arrange one pipe bend to take care of the entire expansion of a long run of pipe at a minimum of expense. Properly designed pipe bends relieve the entire system of piping from expansion strains, reduce leakage at the joints, and eliminate upkeep cost.

Our Pipe Shop is equipped with modern machinery for making Pipe Bends, Cutting, Threading, Flanging with Craneweld, Cranelap, Shrunk and Screwed flanges, either in Cast Iron, Ferrosteel, Forged and Cast Steel.

We make a specialty of making up all kinds of pipe work to drawings and specifications.

CRANE PIPE BENDS ARE THE STANDARD.



CRANE VALVES.



CRANE VALVES.

Represent all types and sizes necessary for the controlling of fluids and vapors, and are made of brass, hard metal, cast iron, ferrosteel, cast steel and forged steel, in sizes one-eighth to 72 inches, for all pressures and purposes.

CRANE PIPE FITTINGS.

CRANE PIPE FITTINGS.

Represent all the shapes and sizes necessary in the pipe carrying of fluids and vapors, and are made of cast iron, brass, hard metal, malleable iron, steel, ferrosteel and forged steel in sizes one-eighth to 72 inches, for all pressures and purposes.



JENKINS BROS. LIMITED

AGENCIES IN ALL THE PRINCIPAL COUNTRIES OF THE WORLD.

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MONTREAL, CANADA.

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Jenkins Bros

EUROPEAN BRANCH:

6 GREAT QUEEN ST., KINGSWAY,
LONDON, W.C. 2, ENGLAND.

PRODUCTS:—

VALVES—Air Valves, Angle Valves, Automatic Relief Valves, Back Pressure Valves, Blow-Off Valves, Check Valves, Corner Valves, Cross Valves, Equalizing Stop and Check Valves, Fractional Radiator Valves, Gate Valves, Gauge Cocks, Globe Valves, Hose Valves, Injectors, Radiator Valves, Safety Valves, Steam Traps, Valve Boxes, etc.

FIRE UNDERWRITERS' APPROVED APPLIANCES.

Fire Hose Valves, Iron Body Swing Check Valves, Brass O.S. and Y. Gate Valves, Iron Body O.S. and Y. Gate Valves, Indicator Posts, Hub End Gate Valves.

MECHANICAL RUBBER GOODS.

Bibb Washers, Discs, Fuller Balls, Gaskets, Gasket Tubing, Packing, Pump Valves, etc.

PRESSURES AND SERVICE.

Standard Pattern Brass Globe, Angle, Check and Blow-Off Valves, suitable for 175 lbs. working steam pressure or 250 lbs. working water pressure. Tested before shipment to 325 lbs. water pressure.

EXTRA HEAVY BRASS and Iron Body Globe and Gate Valves, suitable for 250 lbs. working steam pressure or 400 lbs. working water pressure. Tested to 800 lbs. water pressure.

Type "K" Standard Pattern Brass and Iron Body Gate Valves, suitable for 125 lbs. working steam pressure or 175 lbs. working water pressure. Tested to 300 lbs. water pressure.

MEDIUM PRESSURE Brass and Iron Body Gate Valves, suitable for 175 lbs. working steam pressure or 250 lbs. working water pressure. Tested to 500 lbs. water pressure.

CAST STEEL VALVES in Globe, Angle, Check, Gate and Stop and Check Patterns, with Monel Metal working parts, for super-heated steam and hydraulic service, suitable for working steam pressures up to 350 lbs. and total temperature of 800 degrees F.

JENKINS VALVES have become the standard for Steam Users everywhere, therefore it is not necessary to enter into a full description here.



INDICATOR POSTS.

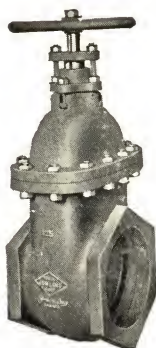


FIG. 401

A type and a size of
JENKINS VALVE
for every service every-
where.

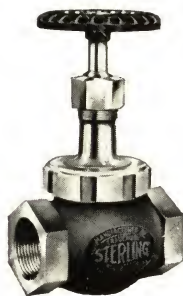


FIG. 500

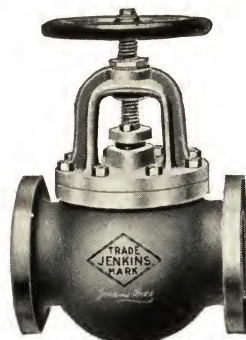


FIG. 142

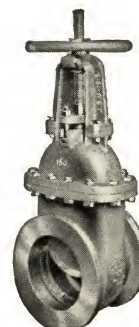


FIG. 404



FIG. 305



FIG. 106



FIG. 300

The complete line
pictured and de-
scribed in Catalog
No. 8. Free on re-
quest.

SHELDONS LIMITED

ENGINEERS - MANUFACTURERS.

GALT, ONTARIO, CANADA.

TORONTO OFFICE: 1002 KENT BUILDING,

PIONEERS IN THE FAN INDUSTRY IN CANADA

THE ONLY ALL-CANADIAN COMPANY IN THE FAN BUSINESS.

ALL CANADIAN CAPITAL—ALL CANADIAN EXECUTIVES—ALL CANADIAN EMPLOYEES.

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PRODUCTS.

Write us or our nearest branch for any information you desire on
FANS, BLOWERS, HEATERS, HEATING APPARATUS, VENTILATING APPARATUS,
AIRWASHERS, MECHANICAL DRAFT SYSTEMS, STEAM SPECIALTIES, EXHAUST FANS,
DRYER EQUIPMENT, Etc.



THE KEITH FAN.

Canada's Popular Air Moving Apparatus.
Specified and Demanded by all leading Architects and Engineers for heating and Ventilating Schools,
Public Buildings and Industrial Plants.

YOU should specify KEITH.

Then you will get an apparatus which is noiseless and economical in operation, neat in design and workmanship and substantially built.

The Keith Fan is originally the product of The James Keith & Blackman Co., of London, England, and was only brought to its present perfect design after years of study and experimental work. The remarkable success which we have had with the Keith Fan fully substantiates the claims made for it by the James Keith & Blackman Co. in its extended use in the British Isles and Europe generally. It has been adopted by the British Navy in preference to other makes of fans, and to a certain extent by the American Navy.

Keith Fans were installed in the engine room or power plant of the Singer Building in New York City, replacing another make of fan. To properly ventilate and cool this great engine room 7,200,000 cubic feet of air per hour is supplied with an expenditure of only 22 horse power. The installation is a complete success, the temperature never being more than 7°F. above the exterior temperature.

HEATING AND VENTILATING ENGINEERING SERVICE.

We maintain a qualified engineering staff whose services are at the disposal of Architects and Engineers without charge. Our Engineering staff will cheerfully furnish specifications, drawings and preliminary estimates on heating and ventilating equipment, and co-operate with our patrons from inception to completion of the contract.

FAN SYSTEMS OF HEATING AND VENTILATION FOR SCHOOLS, PUBLIC BUILDINGS AND INDUSTRIAL PLANTS.

We do not attempt to give herein full details covering all classes of fan installations, but will make an effort to outline such systems which the practicing Architect and Engineer usually have to contend with, also the rules employed to arrive at the proper solution and design of such systems.

For any special work we suggest that the designer call in one of our representatives, who are always willing and qualified to make recommendations for fan systems of all kinds.

SCHOOLS AND PUBLIC BUILDINGS.

In schools and educational buildings in general it is the usual practice to provide 30 cubic feet of fresh air per minute per pupil or occupant. In departments where the number of occupants cannot be estimated the practice is to provide one complete air change every 10 to 15 minutes, except in such cases where the ceilings are exceptionally high, where a less frequent air change will be satisfactory.

In toilet rooms, laboratories and kitchens, a 3 to 6-minute air change should be provided. In such rooms only exhaust ventilation should be applied so the flow of air is always into the room, thus preventing the escape of odors or gases into other parts of the building.

FRESH AIR INTAKE.

A fresh air inlet opening of ample dimensions must be provided. In some localities the fresh air should be taken from a distance of 20 feet above the ground, or from the roof and down into the fan room. In localities where there is no danger of dust entering the fresh air intake, same may be made directly through the wall into the fan room. The usual practice is to provide sufficient free area to give a velocity of 1000 feet per minute through the opening.

A guard or screen made of No. 12 gauge wire, $1\frac{1}{2}$ " mesh, mounted on angle iron frame, should be specified for fresh air inlet.

TEMPERING COIL.

From the fresh air inlet the air passes to the tempering coil. This coil should contain sufficient surface to raise the temperature of the incoming air from the lowest probable outdoor temperature to 80 or 82 degrees at the point of leaving the coil. This will allow for 5° to 10° drop in temperature of the air in passing from the fan room to the fresh air supply register in the rooms. The air should enter the rooms at from 72° to 75° F. when used for ventilation only.

Where an air-washer is installed with the ventilating apparatus the tempering coil should be proportioned so the temperature of the air entering the washer will not exceed 55° F. If the air should enter the washer at a higher temperature there is a possibility of it picking up too much moisture. Automatic temperature control is recommended for tempering coils when placed before an air-washer.

AIR WASHER.

The spray water of the Sheldon Spray Airwasher will lower the temperature of the air from 5° to 10° F., depending on the temperature of the spray water.

For description of the Sheldon Spray Airwasher see page 4.

RE-HEATER COIL.

The air after leaving the airwasher passes over the re-heater coil. This coil must contain sufficient heating surface to raise the temperature of the air from 50° F. (Temperature of air leaving washer) to 80° or 85° when the air is used for ventilation only. When the air is used for heating as well as ventilation the re-heater coil should be sufficient to raise the the temperature of the air from 50° to 110° or 120° F.

Where no airwasher is installed the re-heater coil is not required as the desired final temperature is obtained with the tempering coil.

FAN.

From the re-heater coil the air is drawn into the fan, which discharges it into the distributing ducts. The fan should be selected to deliver the required volume of air against the resistance to flow of air caused by heaters, airwasher and duct work.

The fan must be of ample size and correctly designed to deliver the required capacity noiselessly and with the minimum expenditure of power.

The Keith fan should be specified, being noiseless and efficient in operation, perfect in design, construction, workmanship and finish.

MOTIVE POWER.

Owing to the convenience of the electric motor it is used almost universally for driving fans, either by means of belt or direct connection. If belted, the distance between centres of fan and motor shafts may be from 6 to 10 feet, 8 feet being the general rule.

All fan motors should have at least 25% surplus power over that actually required at the fan, as the characteristics of centrifugal fans when operating at constant speed are such that the volume of air will increase if the resistance to flow is decreased, with the consequent overloading of motor unless a margin of power is provided.

LEATHER BELT.

For small fans using not over 5 H.P., single weight belts are satisfactory. For fans requiring more power double leather belts should be specified. All belts should be made endless with glued joints.

AIR DUCTS.

Ducts, flues or tunnels which convey the air from the fan to the desired points must be of proper size and design to carry the air noiselessly. Small ducts give high velocities which may create noise, besides increase the frictional resistance in the system, thus increasing the power required to deliver the air.

The size of duct, flue or fresh air inlet in square feet to pass a given volume of air per minute is determined as follows:—

$$\frac{\text{Volume in C.F.M.}}{\text{Velocity in ft. per min.}} = \text{Sq. Ft. Area.}$$

For convenience we give below a table of velocities which may be used to figure sizes of ducts, flues, fresh air inlets, etc., etc.

ALLOWABLE VELOCITIES IN VENTILATING SYSTEMS FOR PUBLIC BUILDINGS.

Fresh Air Inlet,	1000 ft. per min.	Main Ducts,	1000 to 1400 ft.
Tempering Coil,	1000 to 1200 ft.	Branches,	800 ft.
Air Washer,	600 ft. per min.	Vertical Flues,	600 ft.
Re-heater Coil,	1000 to 1200 ft.	Supply Registers,	450 ft.
Fan Outlet,	2000 to 2500 ft.	Exhaust Registers,	350 ft.

NOTE

Supply registers located 7' 6" above floor; exhaust registers located at floor. Figure registers and grilles at 70% free area. Figure fresh air inlet screen at 80% free area.

ARRANGEMENT OF APPARATUS.

Fig. No. 3 shows an apparatus lay-out in plan. The spacing and arrangement of the different parts of the apparatus are such as to give the air a direct and uniform flow throughout and to allow free access to all the parts. The distances between the parts should not be decreased from those shown, but can be increased to advantage in many cases, particularly the distance from the fresh air inlet to the tempering coils and from the reheating coils to the fan.

Where it is at all possible, there should be a free space of 3 feet around the apparatus, to allow of attendance and free access to any part that might have to be repaired or replaced.

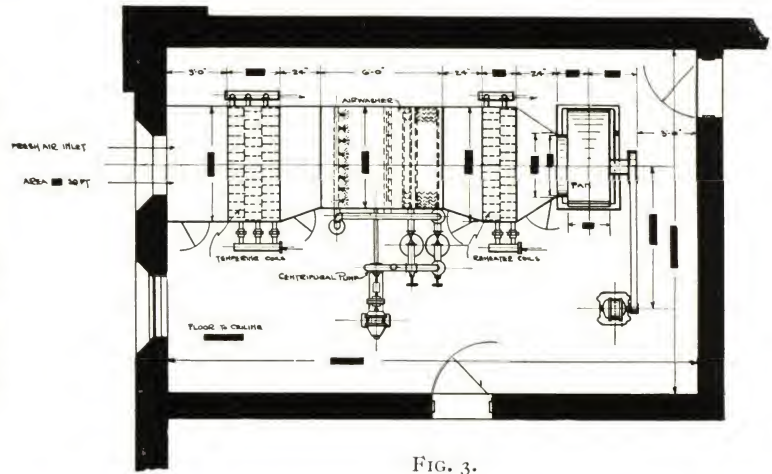


FIG. 3.

SIZE OF APPARATUS ROOM.

For apparatus arranged as shown and including the 3-foot space, and also for apparatus with fan direct driven, the room sizes given in Table No. 2 will be found suitable in most cases.

TABLE NO. 2.

CUBIC FEET OF AIR PER MINUTE.	APPARATUS WITH FAN BELT DRIVEN.			APPARATUS WITH FAN DIRECT DRIVEN.		
	Length. Ft.	Width. Ft.	Height. Ft.	Length. Ft.	Width. Ft.	Height. Ft.
Up to 10,000.....	24	17	9	25	13	9
10,000 to 15,000.....	26	18	10	26	14	10
15,000 to 20,000.....	27	19	10	28	15	10
20,000 to 25,000.....	28	19	11	29	16	11
25,000 to 30,000.....	29	20	11	30	17	11
30,000 to 40,000.....	30	21	12	31	18	12

For apparatus having the inlet side of the fan at right angles to the face of the re-heater coils, add 1 foot to the width of the rooms given in the table for apparatus with fan direct driven.

The above measurements are for standard installations, *i.e.*, arranged to give highest efficiency, and in cases where the conditions make it necessary to change the design, the sizes of the rooms may vary. Where the installation does not include an air washer, approximately 8 feet may be cut off the length of the room.

IMPORTANT POINTS IN FAN INSTALLATION.

If fan is driven by electric motor, the motor should have a surplus power of 25%, as the characteristic performance of a fan is such that the fan will overload if the resistance against which it is working is less than that calculated.

Do not allow a fan equipment to be crowded into a small room and be erected in a haphazard manner. It is always an important installation, and you expect good results from it. Put it in, therefore, as you would an engine or steam turbine in a power-house.

BOILER HORSE POWER REQUIRED FOR VENTILATION SYSTEM.

It will be understood that the foregoing literature pertains to ventilating systems only where the temperature of the air is not raised beyond 80° F. For fan heating systems higher temperatures are required.

The amount of steam required per 1,000 cubic feet of air for tempering and re-heating coils in ventilating systems may be obtained from the following table, which is based on severest conditions.

TABLE NO. 3.

LOCALITY.	Temp. of Incoming Air.	Total Coils, Sq. Ft.	Condensation per Sq. Ft. (lbs.)	Total Cond. (lbs.)	Equivalent Boiler H.P.
Maritime Provinces	10° below	55	1.92	106	3.6
Quebec and Northern Ontario	30° below	60	2.21	132	4.5
Central and Western Ontario	10° below	55	1.92	106	3.6
Western Canada	40° below	60	2.31	140	4.7
British Columbia	Zero	51	1.84	94	3.2

The coils referred to in the above table may be Sheldon Standard Pipe Coil Heaters or Cast Iron Vento Radiation. The quantities in square feet are not exact for every installation but are close enough to make preliminary calculations. The boiler horse power per 1,000 cubic feet of air can be relied upon for any installation.

FACTORY HEATING SYSTEMS.

For factory heating systems, or in such systems where the entering air, besides ventilating the building, is used to heat it as well, the final temperature of the air is generally about 120° or 130° at the fan outlet. Where very large volumes of air are delivered into rooms, a lower temperature, such as 110°, is sufficient, as the excess of air delivered more than makes up for the fall off in temperature.

We recommend that factory heating systems be based on heat transmission and leakage as far as quantity of air and final temperature are concerned. The transmission in B.T.U. for building materials may be obtained from Kent's Mechanical Engineer's Handbook or other reliable source.

The galvanized iron piping to distribute the air should be proportioned so the air velocity will gradually reduce from about 2000 feet per minute at the large end of the main to 800 feet at the end farthest from the fan. A velocity of 800 feet through the outlets will be satisfactory and outlets should be faced so they will discharge the air towards the floor.

It is good practice to direct a volume of air against cold walls, windows or large doors which are frequently opened, to counteract any incoming cold drafts.

Factory heating systems may be installed in three ways: 1st, using all fresh air; 2nd, using part fresh air and part re-circulated air; 3rd, using all re-circulated air. Satisfactory heating may be obtained with either system, but ventilation is obtained only with the two first-mentioned arrangements.

We maintain a competent staff of engineers and draftsmen and will cheerfully furnish plans and specifications without charge.

THE SHELDON SPRAY AIR- WASHER.

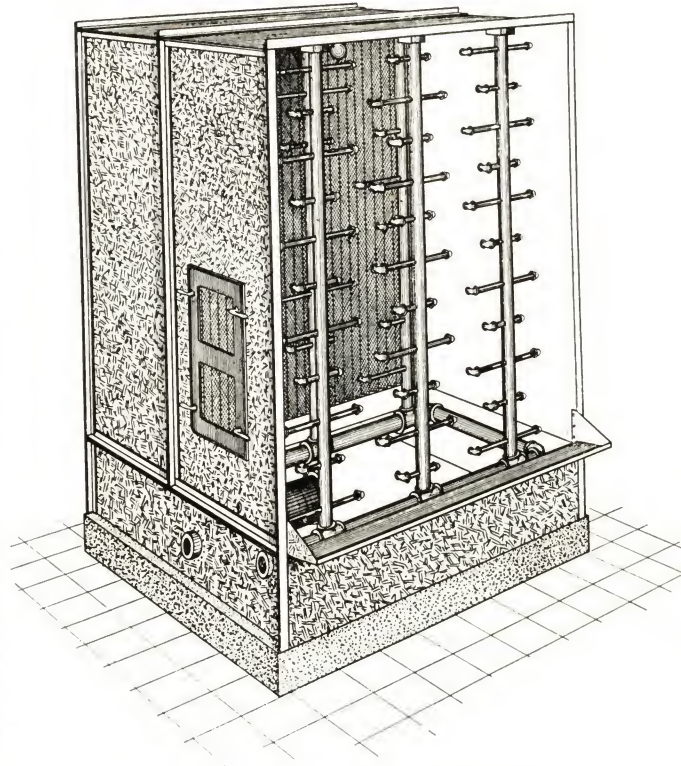
The Sheldon Spray Airwasher is meeting with an increased demand through Canada on account of its simplicity and ease of operation and high efficiency as an air-cleaning medium.

This modern airwasher has been developed for application to all conditions met with in the ventilation of buildings. In any kind of weather a constant supply of clean air at nearly constant humidity is assured. It is equally adaptable with slight alterations for air cooling, and also humidifying.

GUARANTEE.

When the washer is operating under full capacity conditions it is guaranteed to remove 99% of the suspended matter in the air as coarse as boiler soot and 95% of the finest dust as found in ordinary air as determined by the following test:

One pound of dry boiler soot is to be sifted into the entrance of the washer and uniformly across its face in one minute's time for each 10,000 cu. ft. capacity of the washer. 90% of the soot is to be washed from the air before leaving the washer as determined by a sheet of white paper not less than 10" square coated with white adhesive coating suspended at right angles to the flow of air leaving washer.



THE SHELDON SPRAY AIRWASHER TYPE "B"

SPECIFICATION SHELDON TYPE "B" AIRWASHER.

Furnish and install where shown on plans one Sheldon Type "B" Spray airwasher, having capacity of cu. ft. of air per minute at velocity not exceeding 600 feet per minute. Washer to be complete with spray chamber, inspection door, atomizing nozzles, flooding pipe, flooding plates, eliminators, water tank, strainer, float valve, overflow and drain connections, water pressure gauges, marine lamp and centrifugal pump with direct connected motor.



CUT OF PARTS FORMING NOZZLE

CASING AND TANK.

The casing to be made of firmly braced with angles and provided with water-tight cast iron inspection door 18" x 30". The tank to be 12" deep, made of, all joints to be rivetted and soldered. Pipe flanges to be provided for fresh water supply, spray chamber supply, flooding pipe supply, overflow and drain connection and suction to pump.

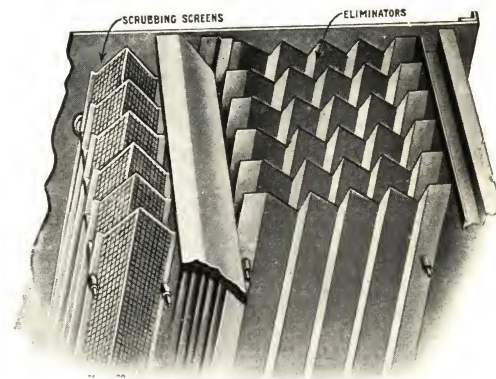
SPRAYS.

The spray nozzles to be of bronze and one spray nozzle to be provided for each 300 cubic feet capacity of the washer, and in addition one scrubber nozzle shall be provided for each 600 cubic feet capacity.

ELIMINATORS AND FLOODING SCREENS.

The eliminators shall be made of, uniformly spaced on centers, not exceeding $1\frac{1}{8}$ ", with hard rubber spacers and mounted on brass rods.

The flooding screens shall be made of, uniformly spaced on centers not exceeding $2\frac{1}{2}$ ", with hard rubber spacers and mounted on brass rods.



SECTIONS OF ELIMINATORS

OUTSIDE PIPING.

All pipe outside of washer to be furnished and installed by contractor. This pipe shall be galvanized and of sizes shown on plans.

PUMP AND MOTOR.

The pump shall be horizontally split double suction type, having capacity of 1.2 gallons per minute for each spray head in the washer, and shall deliver the required capacity against resistance of 60-foot head. The pump shall be direct connected to H.P. phase cycle volt R.P.M. motor. The entire unit to be mounted on cast iron sub-base. Suitable starting device to be supplied with motor.

CANADIAN SIROCCO COMPANY, LIMITED

WINDSOR, ONTARIO.

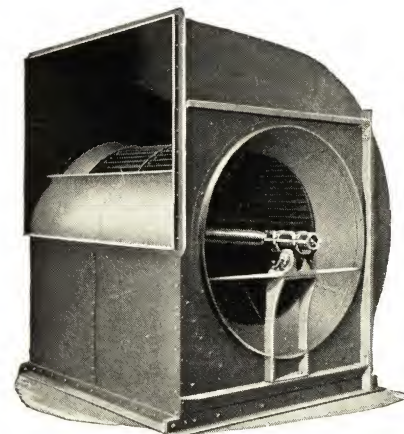
BRANCHES: TORONTO, MONTREAL, WINNIPEG, CALGARY.

It is possible in the small space of one page to give only a general idea of the line of heating, ventilating and air conditioning equipment bearing the "Sirocco" trade mark. We are able to furnish detailed bulletins on all of such equipment and will be glad to send any special catalogue to those interested.

SIROCCO FANS.

Sirocco Fans are used for heating, ventilating, air conditioning, mechanical draft, drying, mining and exhaust systems for handling shavings, chips and other materials. The different types of fans we make are designed to meet the varying requirements of a great number of classes of installations.

THE "SIROCCO" FANS are the standard wherever ventilating fans are used. The chief distinguishing feature of the "Sirocco" Fan lies in the design of the blast wheel and the efficiency, durability and the large capacity of this fan are due in a great measure to the special construction of the wheel. It is a combination of mechanical refinements of design and detail by which the "Sirocco" Fan produces such high volumetric and mechanical efficiencies.



SIROCCO FAN

VENTURA FANS.

The Ventura Disc Fan is equipped with either motor or pulley drive. It is used as a wall ventilator for exhausting fumes from metal pickling vats, for exhausting paint fog from paint spray booths, for ventilating basements, toilets, kitchens, offices, etc., and where rooms are very large, four to six, and sometimes more, Ventura Fans are used to insure proper circulation of air. The slight operating costs of Ventura Fans are very inviting to the consumer. Fans can be installed in any convenient location, and require very little space.



VENTURA FAN

ABC AIR WASHING FAN.

THE ABC AIR WASHING AND COOLING FAN is a simple and efficient mechanical means of washing, humidifying and delivering a large volume of air at a low initial and operating cost. It requires a minimum of attention and occupies a small amount of floor space.

THE ABC AIR WASHING AND COOLING FAN is designed to fulfil this aim.

It washes and purifies the air by removing solid particles, dust, with its attendant bacteria and similar impurities.

Humidifies the air by evaporation of spray water continuously diffused through it.

Cools the air because the process of evaporation withdraws heat.

Combines a fan and washer in one unit, doing the work of both at practically the same cost of operation of the fan alone.

THE SIROCCO AIR WASHER

Used in public buildings, offices, manufacturing plants, or wherever necessary for conditioning the air for improved working conditions, or better handling of goods. In washing the air the removal of

SIROCCO AIR WASHER.

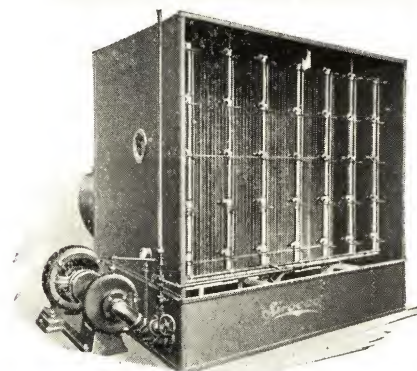
dirt, dust and soot should not be the only consideration. Air should enter a room pure, free from the above, as well as from obnoxious odors and bacteria. To properly cleanse air, removing practically all of the foreign material and gases, it is necessary that the Air Purifier incorporate the following:

Mist Spray from nozzles.

Large Spray Chamber so that the air will be in contact with a bank of mist for a comparatively long period.

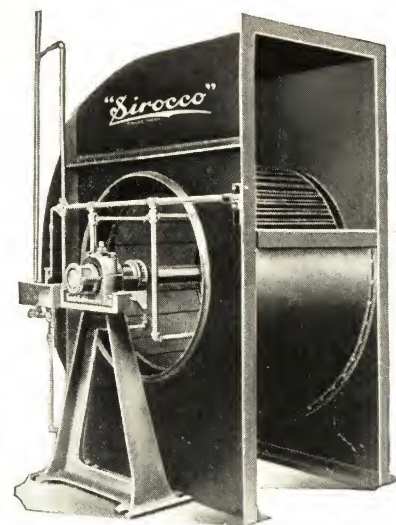
Wet, or scrubbing surfaces.

Sufficient eliminator surface for the removal of entrainment.



SIROCCO AIR WASHER

The "Sirocco" Air Purifier incorporates every one of these qualifications. Air conditioning is a system not usually installed for temporary use — therefore, it should have lasting qualities and as an air purifier is the unit in the air conditioning system that is subjected to the most deteriorating influence, it is essential that special attention be given to its construction. You will find that the "Sirocco" design embodies all of these features with a permanence and high grade of material which is so essential to the proper working of the purifier.



A.B.C. AIR WASHING AND COOLING FAN

LA CIE CANADIENNE SIROCCO LIMITEE

WINDSOR, ONTARIO.

FABRIQUE AU CANADA "SIROCCO".

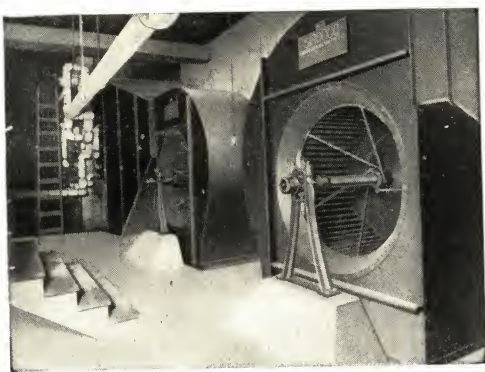
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605 RUE SECONDE OUEST, CALGARY, ALTA.
RUES MCDUGALL ET BANWELL, WINDSOR, ONT.

PRODUITS.

FABRICANTS DE L'EQUIPMENT POUR CHAUFFAGE, VENTILATION ET CONDITIONNEMENT DE L'AIR.



LES VENTILATEURS "SIROCCO" DANS UN HAUT ECOLE.

OBJETS D'USAGE.

lation ou chauffage pour les plus grandes fabriques et édifices publics. Leur superiorité a été démontrée par leur adoption dans les plus grandes fabriques du monde.

Les ventilateurs "Sirocco" sont adoptés aux buts de chauffage, ventilation, épauement, purification, refroidissement, humidification, déhumidification, et séchage dans le bureau, les édifices publics, éducateurs et industriels.

Ventilateurs et chalumeaux "Sirocco," chalumeaux d'utilité électriques "Sirocco," chalumeaux d'acier à pression, ventilateurs à multi-lame, chalumeaux et épauiseurs "Universal," ventilateurs à disque "Ventura," trappes à vapeur inclinantes "Detroit," ventilateurs à courant mécaniques "Sirocco," machines "A B C" directement jointes, à huiler d'elle-mêmes, et verticalement entourées.

Les manufactures de ventilateurs et chalumeaux de la Cie Canadienne Sirocco Limitée comprennent des modèles de petits ventilateurs pour le bureau aux systèmes complets de venti-



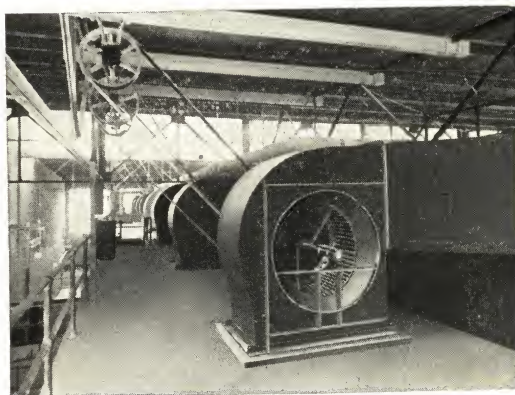
UNE TRAPPE A VAPEUR INCLINANTE DETROIT A.B.C.

MACHINE A "DETROIT". VAPEUR VERTICALES "A.B.C."

Cette machine est fabriquée dans un modèle entouré, à huiler d'elle-même et est particulièrement adoptée à directe connexion aux ventilateurs, pompes centrifuges, attisoirs, générateurs, etc. Elle a une grande vitesse et est fort efficiente.

TRAPPES A VAPEUR INCLINANTES

Cette trappe est construite dans les modèles renversants, divisants, vacuum et condensants. Elle en est fait usage pour condensation automatiquement renversante de tuyaux à vapeur directement à la chaudière sans pomper.



UN SYSTEME INDUSTRIEL POUR SECHER ET CHAUFFER.

CANADIAN BLOWER AND FORGE CO., LIMITED

HEATING, VENTILATING, DRYING, MECHANICAL DRAFT EQUIPMENT AND PUMPS.

KITCHENER, ONT.

BRANCHES:

TORONTO: 186, KING ST., W.
WINNIPEG: GEO. A. YOUNG,
140 WALNUT ST.

MONTREAL: 128, BLEURY ST.
CALGARY: ELECTRICAL ENGINEERS.

ST. JOHN: R. A. McAVITY.
VANCOUVER: D. G. BRISON,
STANDARD BANK BUILDING.

PRODUCTS.

HOT BLAST HEATING SYSTEMS, VENTILATING AND EXHAUST FANS, CARRIER AIR WASHERS AND AIR CONDITIONING APPARATUS, BLOWERS, DRYING SYSTEMS.

CONOIDAL FANS.

NIAGARA CONOIDAL FANS.—These fans are designed to operate at the speeds met with in ordinary heating and ventilating practice. This fan is unquestionably the strongest and most efficient commercial fan on the market to-day for heating, ventilating, drying and mechanical draft work.

The fan is of the multiblade type and is built with wheels, having curved blades conformed to the surface of a cone which gives it its name. The fans are built of three types with single and double curved blades, according to the work for which they are to be used. Single curved blade fans are used for ordinary ventilating work, where slow speeds and low velocities are necessary to prevent objectionable noise. Double curved blade fans are used for high speeds and forced draft work.

Many types of multiblade fans are built with restricted casings and small outlets or with false outlets which do not reduce the velocity of the discharged air. In order to secure satisfactory results, particularly for school house and public building work, it is necessary that the fans be designed with low outlet velocities for handling a large volume of air at highest efficiencies.

The Conoidal Fan is designed to convert as much of the velocity pressure of the air as possible into effective static pressure and we guarantee that the static pressure of the air from any point of the fan outlet is not more than 15% above or below the average.

The illustration which shows the shape of the wheel and blades, readily explains why the Conoidal Fan with the proper proportioning of its various parts is capable of giving the greatest air delivery with the highest efficiency.

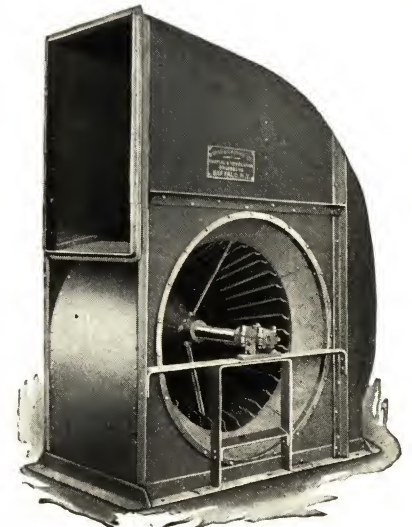
These fans are built in all sizes, including the small Baby Conoidal Ventilating Sets with cast iron housing.

Our Catalogue No. 700 describes our fan system of heating, Ventilating and Humidifying, and Catalogue No. 421 describes our Niagara Conoidal Fans. Both of these Catalogues contain valuable information regarding Heating and Ventilating work.

BABY CONOIDAL FANS.

The Baby Conoidal Fan is of the high efficiency multiblade type. Housing is cast iron and can be swung around to discharge in any desired direction. This fan furnishes a large volume of air at relatively low pressure with moderate speed. The wheel is accurately-balanced, insuring a smooth running, noiseless machine; its "hum" is almost inaudible.

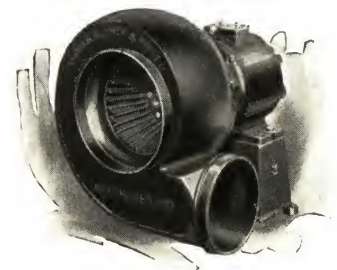
It is unexcelled for supplying fresh, cool air to offices, homes, staterooms, telephone booths, etc., and for exhausting smoke, fumes and foul air from kitchens, restaurants, lavatories, etc.



THREE-QUARTER HOUSING NIAGARA CONOIDAL FAN LEFT-HAND TOP HORIZONTAL DISCHARGE, FOR OVERHUNG PULLEY OR DIRECT CONNECTION.



NIAGARA CONOIDAL WHEEL



BABY CONOIDAL FAN

CARRIER AIR WASHERS.

Carrier Air Washers and Humidifying Apparatus are accepted as standards by the best engineers in Canada and the United States. The Carrier Air Washer was the pioneer in the field, and Carrier engineers have kept the Carrier Washer and Humidifier far in advance of other apparatus of this kind.

The value of proper humidity with automatic regulation is recognized by all authorities and has become a part of the Fan System of Heating and Ventilating.

There are three primary requirements in the design of an effective Air Washer and Humidifier, all of which are embodied in the Carrier apparatus.

1. The Spraying System.—This must be simple and uniformly distributed over the area of the washer. The spray must be finely atomized in order to get effective results. Spray nozzles must have unobstructed large orifices and be self cleaning in order to prevent clogging. Proper strainers should also be provided.

2. Washing Surface.—Experiments have demonstrated that a washer with the proper flooding or washing surface is more efficient for air cleaning. In fact, the washing surface plays the most important part in the removal of dirt and fine material suspended in the air.

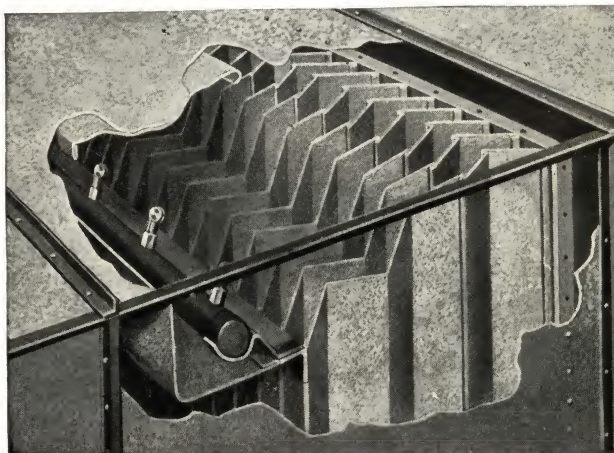
3. Low Frictional Resistance.—Friction in the delivery of air means the expenditure of power and an air washer to be efficient, must be arranged so as to provide the smallest possible resistance to the flow of air.

The illustrations show the general arrangement of the interior of the Carrier Washer with spray and flooding nozzles, also eliminators, the first four corrugations of which are constantly flooded with a sheet of water which catches any solid matter not already precipitated in the spray chamber.

Carrier Catalogue No 480 gives complete data and information.



INTERIOR VIEW OF CARRIER AIR WASHER



PART OF CASING REMOVED, SHOWING ELIMINATORS AND FLOODING NOZZLES

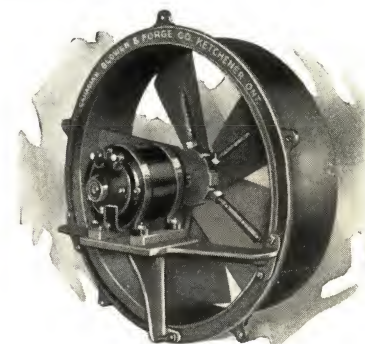
ELECTRIC DISC FANS.

These Disc Fans are built in all sizes from 16" to 48" and can be supplied with automatic shutters. They are used for restaurant, laundry and kitchen ventilation, as well as for removing smoke, fumes and dust, where no duct system is installed. They are noiseless in operation and require no attention except an occasional oiling.

PUMPS

We manufacture a complete line of Condensation Return Pumps as well as pumps for handling sewage where basement or boiler rooms are located below the sewer line. We also manufacture all sizes of Centrifugal Pumps, both belt driven and direct connected. These are built for high and low heads.

Bulletins illustrating any type of pump will be forwarded on application.

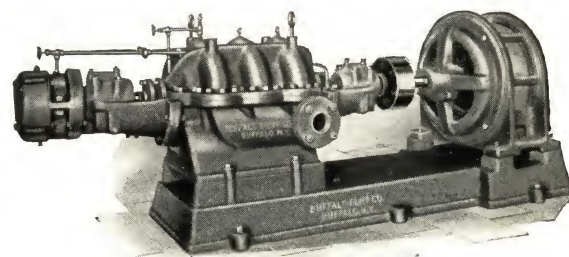


ELECTRIC DISK FAN

INSTALLATIONS.

Among recent notable installations of Conoidal Fans and Carrier Air Washers, are those in the

New Parliament Buildings.....	Ottawa
King Edward Hotel.....	Toronto
T. Eaton Mail Order Building.....	Winnipeg
New Hudsons Bay Store.....	Victoria
McGill University Buildings.....	Montreal
Canada Cement Building.....	Montreal
Holeproof Hosiery Plant.....	London
Mercury Mills.....	Hamilton



3 STAGE CLASS "RDS"—MOTOR DRIVEN.

B. F. STURTEVANT COMPANY OF CANADA, LTD.

GENERAL OFFICE AND FACTORY:
GALT, ONT.

J. E. MARTIN, Manager. Telephone No., Galt 690.



SALES OFFICE: NEW BIRKS BLDG.,
MONTREAL.

W. C. ELLIOTT, Manager. Telephone, Uptown 7583

TORONTO:—C. B. McBRIDE, Manager. Telephone, Main 7510.

All of our products are sold under the trade mark "STURTEVANT."

PRODUCTS.

HEATING AND VENTILATING EQUIPMENT.

Multivane Volume Blowers
and Exhausters.

Propeller and Disc Type
Volume Exhaust Fans.

Fuel Economizers.

Mechanical Draft Apparatus.

Turbine and Steam Engine
Generator Sets.

High Pressure, Medium Pressure
and Low Pressure Blowers.

Volume Blowers.

Planing Mill Exhausters.

Dry Kilns.

Heaters.

Air Washers.

Engines and D.C. Motors.

POWER HOUSE EQUIPMENT.

Gasoline Electric Generator

Sets.

Generator Cooling.

INDUSTRIAL EQUIPMENT.

Cupola Blowers.

Gas Blowers and Boosters.

Gas Exhausters.

Forges and Forge Blowers.

Galvanized Duct Work.

Portable Ventilating Sets.

Autoforce Ventilators.

Steam Engines.

Steam Turbines.

Transmission Gears.

Acid Proof Fans.

Pneumatic Collecting and

Conveying Systems.

Steam Exhaust Heads.

AIR CONDITIONING EQUIPMENT.

Paper, Glue, Wood and Leather Drying,

Vapour Absorption Systems.

Air Washing, Humidifying and Dust

Removing Systems.

Dehumidifying Systems.

VACUUM CLEANING EQUIPMENT.

Stationary Plants for Home and Industrial Use. Portable Vacuum Cleaners of all sizes for all work.

PUBLICATIONS.

The STURTEVANT line is so varied that a comprehensive presentation in one publication is undesirable. We have, therefore, issued a special bulletin on each particular line, covering the mechanical details.

ENGINEERING SERVICE.

As each installation is unique, it is usually necessary that an engineer analyze the conditions before making recommendations. The engineering staff of the B. F. Sturtevant Company of Canada, Ltd., has been trained to analyze all conditions and to properly apply our apparatus accordingly. Consult them, they are at your service without obligation.

CATALOGUES.

DRYING APPARATUS.

No. 243 Paper Drying.

273 Veneer Kilns.

No. 282 Lumber Drying.

289 Hosiery Dryer.

HEATING AND VENTILATING.

No. 271 Multivane Fans.

238 Multivane Fans, Performance Charts.

230 Heaters.

227 Heating and Ventilating Layouts—Blue
Print Book.

201 Electric Dust Blowing Sets.

No. 237 Ready to Run Ventilating Sets.

278 Air Conditioning.

283 Autoforce Ventilators.

290 Silentvane Fan.

1015 Heating and Ventilating Book complete.

MECHANICAL DRAFT.

No. 236 Forced Draft Fans

276 Turbo Undergrate Blowers, Design 5.

256 Steam Turbines.

No. 217 D.C. Type D Motors.

259 Vertical Engines.

288 Forced and Induced Draft with Mechan-
ical Stokers.

PLANING MILL FANS AND DUST CONVEYING SYSTEMS.

No. 185 Slow Speed Low Power Planing Mill
Exhauster.

234 Steel Plate Blowers and Exhausters.

No. 252 Steel Plate Fan Performance Chart.

291 Pneumatic Dust Collecting and Convey-
ing Systems.

POWER APPARATUS.

No. 239 Vertical Single Cylinder Steam Engines.

256 Steam Turbines.

217 Type D, Direct Current Motors.

239 Steam Engine Generator Sets.

255 Gasoline Electric Generating Sets.

256 Steam Turbine Generator Sets.

No. 150 Fuel Economizers.

264 Electrical Apparatus.

274 Turbo-Transmissions.

275 Gear Transmissions.

284 Polyphase Motors.

PRESSURE APPARATUS.

No. 257 Positive Pressure Blowers.

258 Design 4 and 5 Pressure Blowers.

260 Design 4 and 5 Pressure Blowers—Per-
formance Tables.

No. 292 Monogram Blowers and Exhauster.

265 Steel Pressure Blowers.

MISCELLANEOUS.

No. 195 General Catalogue.

25c Architect's and Engineer's Data Book. Carefully prepared, giving full technical information usually required. It contains 960 pages of invaluable information covering Heating and Ventilating.

266 Forges.

THE GOLDIE & McCULLOCH CO., LIMITED

HEAD OFFICE AND WORKS: GALT, ONT., CANADA.

WESTERN BRANCH:
248 McDermott Ave.,
WINNIPEG, MAN.

TORONTO OFFICE:
1101-2 Bank of Hamilton Building.

QUEBEC AGENTS:
ROSS & GREIG, 400 St. James St.,
MONTREAL, QUE.

BRITISH COLUMBIA AGENTS: ROBT. HAMILTON & Co., Bank of Nova Scotia Bldg., VANCOUVER, B.C.

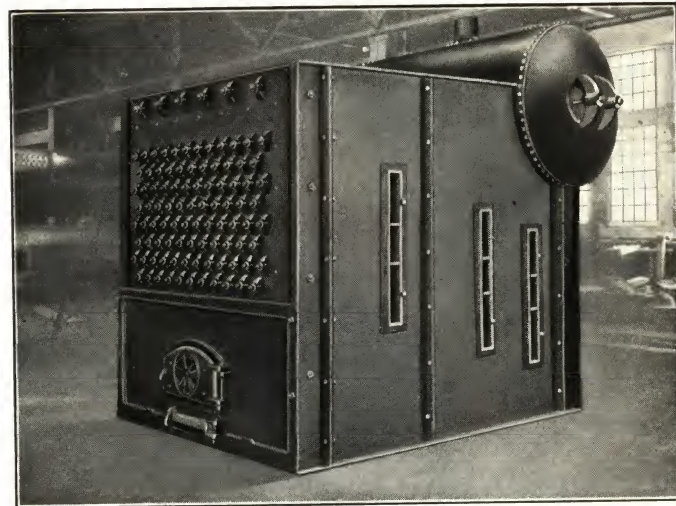
PRODUCTS.

RETURN TUBULAR AND WATER TUBE BOILERS, HORIZONTAL AND VERTICAL STEAM ENGINES, MARINE ENGINES, STEAM TURBINES, PUMPS AND CONDENSERS, HEATERS, TANKS, STACKS, Etc. Also SAFES, VAULTS AND VAULT DOORS. (See Adv't page 242.)

BOILERS.

Our new catalogue covering Sectional Water Tube Boilers is just off the press, a copy is yours for the asking. The illustrations and list of installations shown therein furnish sufficient evidence of their popularity.

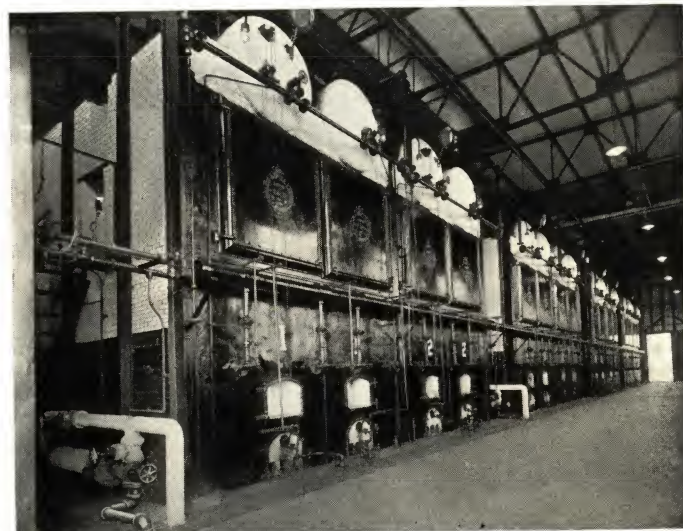
The upper illustration shows our new type "H" Low Pressure Water Tube Heating Boiler, which should be of more than ordinary interest to Architects and Contractors, as it has been specially designed for heating of public buildings of all kinds. We shall welcome the opportunity of supplying those interested with complete details, plans, etc. With the largest and best equipped boiler shop in Canada we are well able to look after your requirements promptly and efficiently.



GOLDIE & McCULLOCH TYPE "H" WATER TUBE HEATING BOILER.

ENGINES.

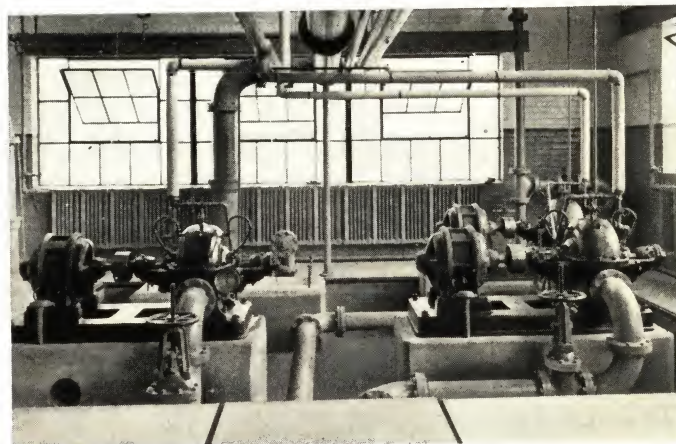
We build engines to meet practically any and every condition of service. Among them the Wheelock Slow speed; Goldie Corliss; Ideal High speed; Vertical enclosed forced lubrication high speed engines; Marine engines and steam turbines.



A RECENT INSTALLATION OF 8 DOUBLE DRUM G. & McC. SECTIONAL WATER TUBE BOILERS AT THE DARTMOUTH, N.S., PLANT OF THE IMPERIAL OIL CO. SINCE PHOTO WAS MADE TWO MORE BOILERS HAVE BEEN ADDED TO THIS PLANT.

HEATERS, PUMPS AND CONDENSERS.

These include our Ideal Open type Feed Water heaters; Square, cast iron open type heaters; Reciprocating Boiler Feed Pumps; **REES-ROTURBO** Centrifugal pumps, Air pumps and condensers; Vertical marine pumps; the "Contraflo" system of condensing, Feed Water Heating, Grease extracting, etc.; and Morrison's Radial Evaporators for Marine purposes.



REES-ROTURBO CIRCULATING PUMPS RECENTLY INSTALLED AT THE PLANT OF THE MATCH COMPANY, LIMITED, BERTHEVILLE, QUE.

CATALOGUES AND SPECIFICATIONS.

We shall be glad to submit plans, specifications, catalogues, etc., to Architects, Contractors and others interested. Our Engineering Department is always at your service should you require their assistance.

THE JOHN INGLIS CO., LIMITED
ENGINEERS AND BOILERMAKERS,
14 STRACHAN AVENUE,
TORONTO, ONT.

PRODUCTS.

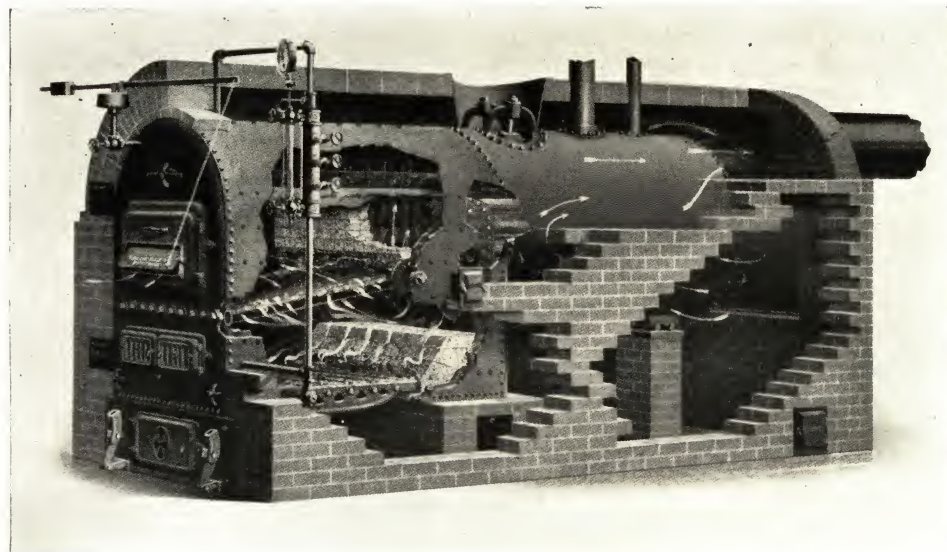
We are sole Canadian makers of ERIE CITY WATER TUBE BOILERS, Vertical and Horizontal.

We also make BOILERS of all kinds for any service—RETURN TUBULAR, FITZGIBBON, SCOTCH MARINE, SCOTCH DRYBACK, LOCOMOTIVE AND SUBMERGED TUBE, and FIREBOX TYPE for heating purposes.

ENGINES and PUMPS of all kinds for any service.



STANDARD RETURN TUBULAR POWER BOILER



SMOKELESS FIREBOX BRICKSET INGLIS HEATING BOILER

OTHER
PRODUCTS.

Tanks—Air, Oil, Varnish, Soap and Lye Tanks.

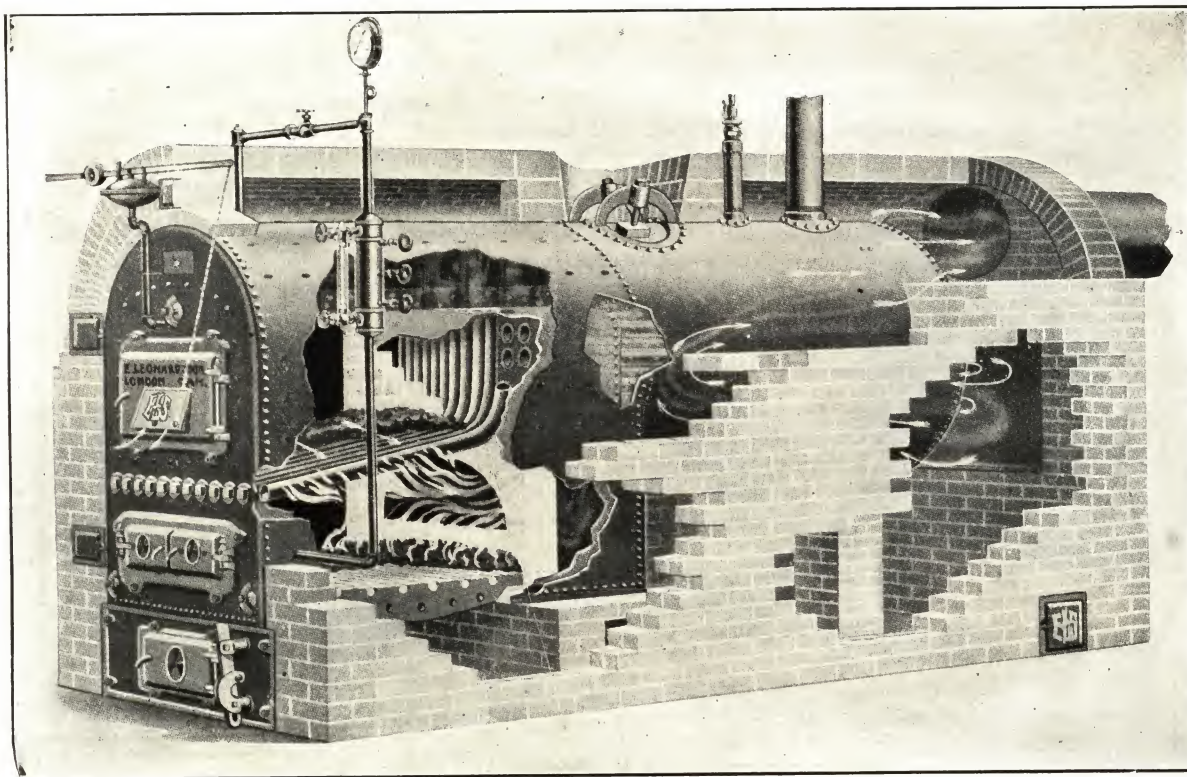
Plate Work—Penstocks, Stand Pipes, Steel Tanks, Stacks, etc.

MANUFACTURERS OF
ENGINES AND BOILERS FOR ALL PURPOSES.
LONDON, CANADA.

WM. W. HICKS, 567 Banning St., Winnipeg, Man.
 GEORGE STEWART, 5 Lineham Block, Calgary, Alta.
 VANCOUVER MACH'RY DEPOT, LTD., Vancouver, B.C.
 W. E. PIPPY, Waldegrave Street, St. Johns, Nfld.
 ARTHUR S. LEITCH CO., LTD. 1001-2 Kent Bldg.
 Toronto, Ont.

1790 ST. JAMES STREET, MONTREAL, QUE.
62 WATER STREET, ST. JOHN, N.B.

LEONARD SMOKELESS FIREBOX BOILERS. Brickset, Drawn Draft, for Steam or Hot Water Heating.



FIXTURES—Firedoor with improved balanced draft door and frame, lower grate door and frame, ashpit front with ash door. One large and five small soot cleanout doors with frames. Large tube cleanout door and frame for rear wall. Bearing plates with rollers for top of brick pier under shell. Firing tools (poker, hoe and slice bar). Tube scraper with rod. Shaking grates. Rear ash bars and manhole shield.

FITTINGS (Steam Boiler only)—Safety Valve, combination water column with try cocks, water glass, and connecting pipes and valves, steam gauge, syphon and damper regulator.

GENERAL ARRANGEMENT AND BRICK SETTING.

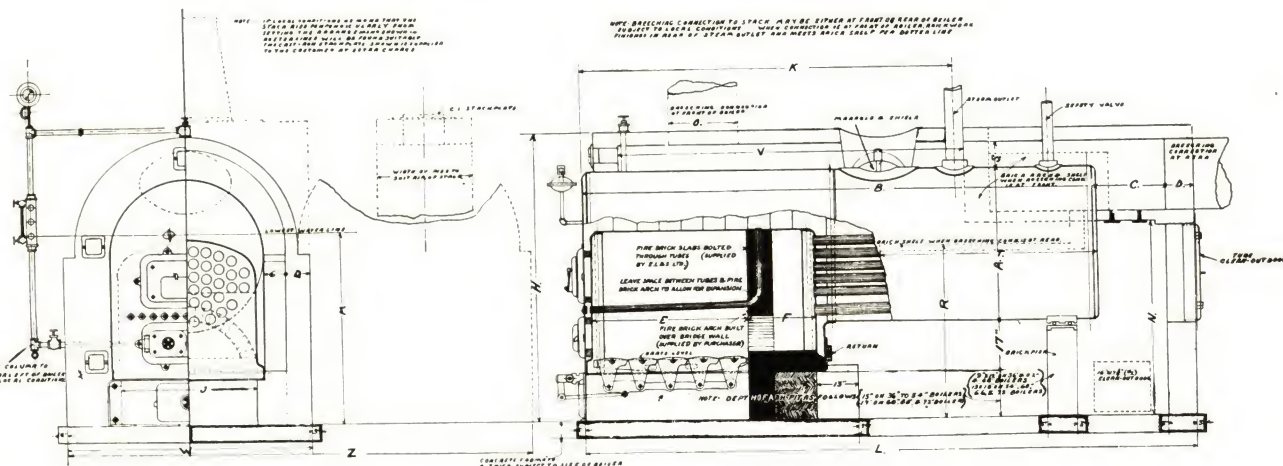


TABLE OF DIMENSIONS.

NUMBER OF BOILER	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Dia. of Boiler	36"	36"	36"	42"	42"	42"	48"	48"	48"	54"	54"	60"	60"	66"	66"	72"	72"
Length of Boiler	8' 0"	10' 0"	11' 6"	9' 0"	11' 3"	12' 0"	12' 0"	13' 6"	15' 0"	15' 0"	18' 3"	17' 9"	20' 3"	18' 3"	20' 3"	18' 3"	20' 3"
Steam Sq. Ft. C. I. Rad. (9 ft.)	1600	2000	2300	2600	3100	3600	4000	4700	5500	6500	7500	8500	10000	11500	13000	14000	16000
Sq. Ft. C. I. Rad. (14 ft.)	2600	3300	3800	4300	5100	5900	6600	7800	9100	10700	12400	14000	16500	19000	21500	23100	26000
Rear Space	C	17	17	22	22	22	22	22	22	24	24	24	24	24	24	28	28
Thickness of Wall	D	6	9	9	9	9	9	9	9	13	13	13	13	13	13	13	13
Grate Length	E	31	37	43	37	43	49	43	55	55	61	61	67	67	67	67	73
Combustion Chamber	F	14	14	17	17	17	21	21	21	23	23	23	23	20	20	20	20
Width of Ashpit	J	31	31	31	37	37	37	43	43	49	49	55	60	60	60	60	60
Total Height	H	70	70	70	80	80	80	92	98	98	108	108	114	114	114	120	120
Steam Outlet Location	K	70	70	80	80	90	96	94	90	104	106	110	110	110	116	120	120
Height of Waterline	M	57	57	57	59	59	59	63	63	66	66	66	73	73	78	83	83
Height of Side Flue	N	57	57	57	59	59	59	63	63	66	66	73	73	78	78	83	83
Dia. of Breaching Conn.	O	20	20	22	22	22	24	27	27	30	30	33	36	36	38	38	38
Height of Brick Shelf	R	49	49	49	52	52	52	50	50	50	50	50	50	67	67	70	70
Top Flue Space	S	7	7	7	7	7	7	8	8	8	8	10	10	10	10	10	10
Length of Brick Shelf	T	33	45	57	39	51	63	50	68	80	87	111	105	120	117	123	90
Length of Arch	V	84	90	90	93	101	105	101	107	113	113	110	110	125	121	131	131
Total Length	L	10' 8"	12' 2"	13' 8"	12' 4"	13' 10"	15' 4"	16' 8"	18' 1"	21' 4"	21' 4"	20' 8"	20' 8"	23' 8"	23' 8"	21' 8"	21' 8"
Total Width	V	66	66	72	72	72	78	78	78	92	92	98	98	104	104	110	110
Width of Double Setting	Z	10' 3"	10' 3"	10' 3"	11' 3"	11' 3"	11' 3"	12' 3"	12' 3"	14' 3"	14' 3"	15' 3"	15' 3"	16' 3"	16' 3"	17' 3"	17' 3"
Number of Common Brick		2450	2800	2950	3100	3350	3500	4000	4500	6400	6600	7300	8000	8200	8500	9000	9500
Common Brick for Two Boilers		4200	4850	4950	5400	5900	6200	7000	7850	11250	11800	13150	13950	14550	15200	16000	17000

THE SUPERHEATER COMPANY, LIMITED

WORKS:
SHERBROOKE, QUE.

TRANSPORTATION BUILDING,
MONTREAL, QUE.

WESTERN REPRESENTATIVES:

THE TAYLOR ENGINEERING CO., LIMITED, VANCOUVER, B.C.



DESIGNING ENGINEERS AND MANUFACTURERS OF "ELESco" STEAM SUPERHEATERS
AND PIPE COILS FOR ALL PURPOSES. FEED WATER HEATERS FOR LOCOMOTIVE SERVICE.

PRODUCTS.

Elesco Superheaters for all types and sizes of Stationary Boilers; Separately Fired Superheaters for all purposes; Superheaters for locomotives and steam shovels; Superheaters for marine service. PIPE COILS AND ELESco SUPER COILS for all purposes. Feed Water Heaters for Locomotive Service.

ENGINEERING SERVICE.

The Engineering Department of this company is at the service of those interested in the advantages or application of Superheated Steam.

ELESco SUPERHEATERS.

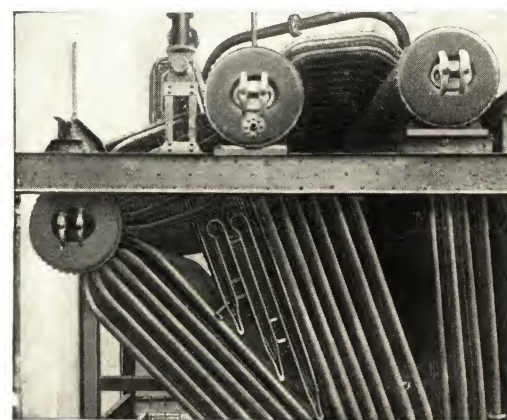
Elesco Superheaters are suitable for all types of boilers without changes to the boiler setting. They reduce fuel consumption, increase boiler efficiency, reduce condensation in steam lines, reduce steam consumption in engines and turbines, and increase the capacity of the plant.

Their design and construction provides freedom from leaks, ease of application and accessibility for inspection and repairs, and maximum length of service without renewal.

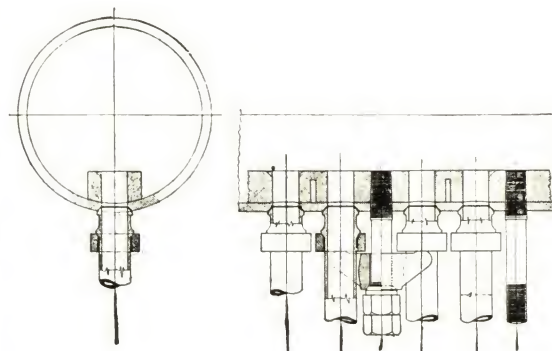
The Elesco Superheater consists in general of two headers, one acting as the distributor for the saturated steam coming from the boiler, and the other as a "Superheated" header for collecting the steam after it has been superheated; and the necessary connecting units in which the actual superheating takes place. The headers are made of steel and located out of the path of the hot gases, and in most cases, outside of the boiler setting proper, affording easy access for inspection and cleaning.

Units are of heavy cold drawn seamless steel tubing located in the advantageous gas temperatures, giving a large ratio of superheating surface, an even distribution to the flow of the gases, and a proper distribution to the steam through the superheater. The units present a smooth surface to the gases, thereby tending to prevent an accumulation of soot and ashes, and are thus easily cleaned. Because of their small diameter and proper distribution they offer a minimum obstruction to the gases.

A metal to metal ball joint forms the connection between the units and the headers, giving a positive tight joint, and avoids the use of hand holes and gaskets.



ELESco SUPERHEATER INSTALLED IN A WATER TUBE BOILER.



SECTION SHOWING HEADER CONSTRUCTION.

SEPARATELY FIRED SUPERHEATERS.

This company designs and manufactures separately fired superheaters for all purposes and for process work, for pressures from atmospheric up to 1,000 lbs. per sq. in., and for temperatures up to 1,000° F. The special features of accessibility, regulation, long life and high efficiency are incorporated in these designs.

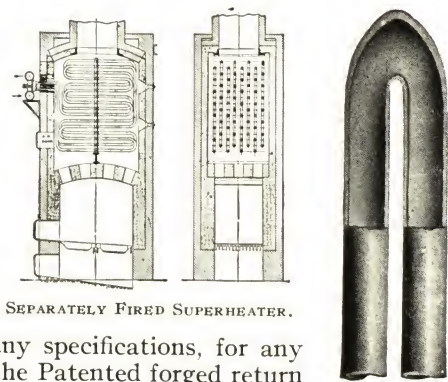
SUPERHEATERS FOR STEAM SHOVELS.

Elesco Superheaters, easily installed in steam shovels, reduce fuel consumption at least 25%. As high a saving in water is also possible.

ELESco PIPE COILS.

The coils are designed and manufactured to practically any specifications, for any purpose. The feature of these coils involving a return bend is the Patented forged return bend, which results in a coil of practically a continuous pipe, without threaded or acetylene welded joints; greatest surface within a given space possible; absolutely leak-proof.

Full descriptive literature on all ELESco Products.



SEPARATELY FIRED SUPERHEATER.

PIPES BONDED BY FORGED RETURN BEND.

MURPHY IRON WORKS

MAKERS OF MURPHY AUTOMATIC FURNACE.
DETROIT, MICH.

SANFORD RILEY STOKER CO.

MAKERS OF RILEY UNDERFEED STOKERS.
WORCESTER, MASS.

BOSTON.
CINCINNATI.

NEW YORK.

PHILADELPHIA.
CHICAGO.

PITTSBURGH.
ST. PAUL.

BUFFALO.

CLEVELAND.
DENVER.

GENERAL.

The type of Stoker you need is determined by the size of your boilers, fuel, load conditions and other local factors. Naturally, one type will not meet all these conditions, but in the Riley Underfeed Stoker and Murphy Automatic Furnace you have a choice that will meet practically any condition.

For the plant with large boiler units or with smaller units that are to be forced above rating or where reserve capacity is essential, the Riley Underfeed Stoker meets the conditions.

DESCRIPTION.

MURPHY AUTOMATIC FURNACE.

The correctness of the principle upon which the construction of the Murphy Automatic Furnace is based has been demonstrated by 44 years of stoker experience. Improvements have been made from time to time which have increased its efficiency and durability. With the Murphy Automatic Furnace, complete combustion prevents smoke and ensures high CO₂ results. All ash and refuse are removed automatically. This means a clean fire and high efficiency at all times. The Murphy Furnace does away with the necessity for opening furnace doors and thereby eliminates the admission of cold air; the coal supply to the furnace is under absolute control and automatic regulation; it is a Natural Draft Furnace and requires no expensive fan or blower equipment.

ADAPTABILITY.

The Murphy Furnace is designed for any type of boiler and units from 50 h.p. up to the larger units for which the multiple retort underfeed stoker is best suited. It is exceedingly flexible and efficiently handles variable loads and overloads up to 200% of boiler rating with minimum attention and without forced draft.

DESCRIPTION

M. I. W. SUSPENDED ARCH.

The M.I.W. Suspended Arch contains a number of important features not found in any other arch manufactured. This design eliminates all expansion strains, cracking and spalling of brick due to expansion and pressure of adjoining brick. It can be constructed in almost any form desired to meet special requirements. The M.I.W. Suspended Arch can be repaired while the furnace is in operation—every brick is supported independently—it can expand freely in any direction—the full life is obtained from every brick.

RILEY UNDERFEED STOKER.

CONSTRUCTION.

The Riley Stoker is made up of standardized retort units. Its unique feature is reciprocating retort sides which keep the fuel bed active and even. The coal feed and air supply are automatically controlled to meet load demands. The dumping of refuse is continuous and automatic. A safety connecting rod for each plunger absolutely prevents damage to stoker in case plunger is blocked.

FLEXIBILITY.

Moving, air supplying grates break up the banked fire and instantly admit the air, giving rapid combustion. Riley Stokers will raise a boiler from banked fire to 250% of rating in five minutes.

EFFICIENCY.

The boiler capacity which can be obtained with the Riley Stoker depends upon the number of retorts that can be installed. With boilers fired from one end 300 and 350% of rating are obtained during peaks. In other cases where boilers are fired by two stokers set back to back 500 and 600% of rating are possible.

INSTALLATIONS.

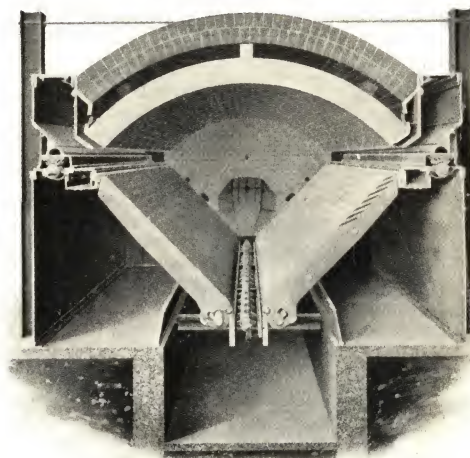
MURPHY FURNACES.

Montreal General Hospital.
Canadian Locomotive Works.
Canadian Kodak Co.
Sherwin-Williams Co.
St. Lawrence Sugar Refining Co.
Laurentide Company, Ltd.
Belgo-Canadian Pulp & Paper Co.
National Cash Register.
Ontario Paper Co., Ltd.
Donnacona Paper Co., Ltd.
University of Toronto.
Montreal Steel Works.
Parliament Bldgs.
Canadian Pacific Railway.
Spanish River Pulp & Paper Co.
Montreal High School.
Bank of Montreal.
Canadian Bridge Co., Ltd.

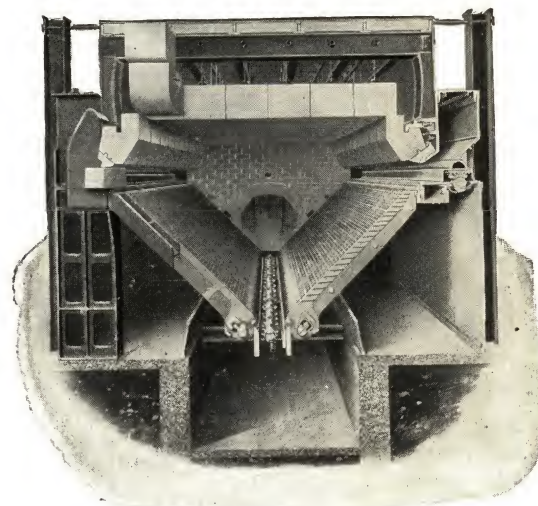
RILEY STOKERS.

Hiram Walker & Sons, Ltd.
General Chemical Co.
Regina Municipal Plant.
Toronto Electric Light Co.
Canadian Cottons Co.

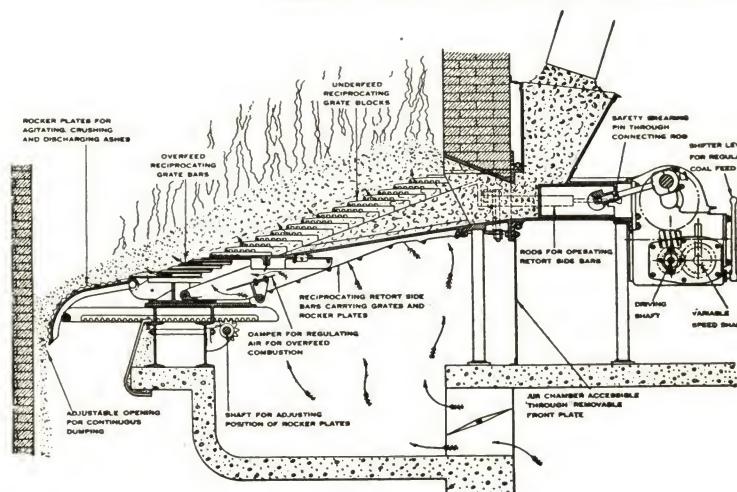
Illustrated catalog MSD gives details of the Murphy Furnace and catalog RSD of the Riley Stoker.



TRANSVERSE SECTION THROUGH THE MURPHY AUTOMATIC FURNACE, SHOWING PRINCIPLE OF CONSTRUCTION.



M.I.W. SUSPENDED ARCH INSTALLED IN CONNECTION WITH MURPHY FURNACE. THIS ARCH CAN BE CONSTRUCTED IN ALMOST ANY FORM TO MEET SPECIAL REQUIREMENTS.



THE UNDER-FEED STOKER CO. OF CANADA, LTD.*

QUEBEC AND MARITIME PROVINCES: 146-152 KING STREET, W., TORONTO, ONT.
 THE CLEATON CO. (CANADA) LIMITED, ALBERTA AND WESTERN SASKATCHEWAN:
 SOUTHAM BUILDING, MONTREAL, QUE. J. TWOMEY, CAMROSE, ALTA.
 MANITOBA AND EASTERN SASKATCHEWAN: W. W. HICKS, 567 BANNING ST., WEST, WINNIPEG, MAN.

BRITISH COLUMBIA:
 E. A. EARLE LIMITED,
 739 HASTINGS ST. W., VANCOUVER, B.C.

PRODUCT.

THE JONES UNDER-FEED MECHANICAL STOKER—THREE TYPES SHOWN BELOW.

DESCRIPTION.

The under-feed principle—originated in the Jones Stoker—makes possible remarkable fuel and labor economy, smoke abatement, regularity of steam pressure, and increased boiler capacity.

This principle is illustrated by the cross-sectional view. The green fuel enters from below the combustion zone and is slowly moved rearward and upward through the retort.

During the travel of the green fuel all volatiles are thoroughly driven off and completely burned as soon as released in connection with coke in the incandescent fuel bed.

The supply of air and fuel are automatically proportioned to insure correct combustion and respond automatically to any change in steam demand. Consequently, steam pressure is constant regardless of load variations.

Rugged simplicity is a Jones characteristic. An installation merely consists of the proper number of the retorts shown above. A heavily oversized steam cylinder is mounted immediately below the hopper, and a ram is connected to the piston of this cylinder. The coal falls in front of this ram and is forced into the retort. Note that the simple pusher rod is the only moving part within the furnace, and that it is buried deep in the green fuel. The travel of the fuel bed is a mechanical and not a gravity movement. The slope of the retorts is not great enough to cause avalanching, holes in fire and similar conditions.

ADVANTAGES.

SIMPLICITY.—Minimum of moving parts. No complicated dumping mechanism.

LOW MAINTENANCE.—No moving parts in fire. Tuyere plates always covered by green fuel, minimizing replacements. No shearing pins to fail and cause breakage. Unequalled accessibility.

HIGH EFFICIENCY.—The scientific application of the under-feed principle, first made successful in the Jones.

AUTOMATIC-CLEANING (IN "A-C" TYPE).—Thorough burning of fuel. Travel of fuel bed is mechanical and not a gravity movement.

PREVENTION OF SMOKE.—Combustion is so complete that there is no smoke.

PREVENTION OF CLINKERS ON SIDE AND BRIDGE WALLS.—Due to the design of the tuyeres, the absence of gravity movement and the "automatic-cleaning" feature.

HEAVY OVERLOAD CAPACITY.—Results from the perfect fuel bed, and responsive control of fuel and air.

MINIMUM OF MOVING PARTS.—Reducing maintenance.

INDIVIDUAL CONTROL OF RETORTS.—Producing an excellent fire at all times.

AUTOMATIC CONTROL OF FUEL AND AIR.—Insuring even steam pressure regardless of load fluctuations.

FUEL ECONOMY.—Because of the complete combustion assured by the system of automatic control of fuel and air, a saving of at least ten per cent. of the fuel is obtained. Additional fuel economy is obtained through the ability of the Jones stoker to burn all fuels.

PULP AND PAPER MILLS.

The Jones Under-Feed Stoker is easily adaptable to utilizing mill waste in connection with coal as fuel for generating steam. When the refuse enters steadily the supply of coal may be cut down; when waste comes slowly coal may be fed more steadily.

TYPES.

The Jones Stoker is made in three important types: The Jones "A-C" (Automatic-Cleaning) Stoker, the Jones "Standard Side-Dump" Stoker, and the Jones "Standard" Stoker. All are illustrated and described opposite and above.

INSTALLATIONS.

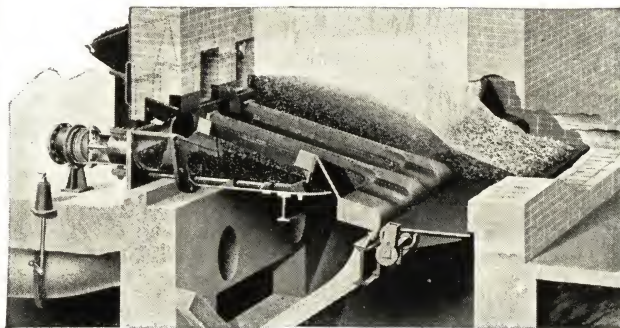
Following are a few prominent Canadian users:

Nashwaak Pulp & Paper Co., St. Johns, N.B.
 Banff Springs Hotel, Banff, Alberta.
 T. Eaton Co., Winnipeg, Manitoba.
 Vancouver Hotel, Vancouver, B.C.
 St. Regis Paper Co., Granby, Quebec.
 Canadian Cottons, Ltd., Hamilton, Ont.
 Winnipeg Joint Terminals, Winnipeg, Man.
 R. H. Comey Co., Toronto, Ont.
 Laing Produce & S. Co., Brockville, Ont.
 Provincial Paper Mills, Port Arthur, Ont.
 Provincial Paper Mills, Mille Roche
 Canada Creosoting Co., Sudbury, Ont.
 Otis-Fensom Elevator, Hamilton, Ont.
 Fort Francis Pulp & Paper Co., Fort Francis, Ont.

Brown Corporation, La Tuque, Quebec.
 Fisher Body Corporation, Walkerville, Ont.
 International Harvester Co., Hamilton, Ont.
 Frazer Companies, Ltd., Edmundston, N.B.

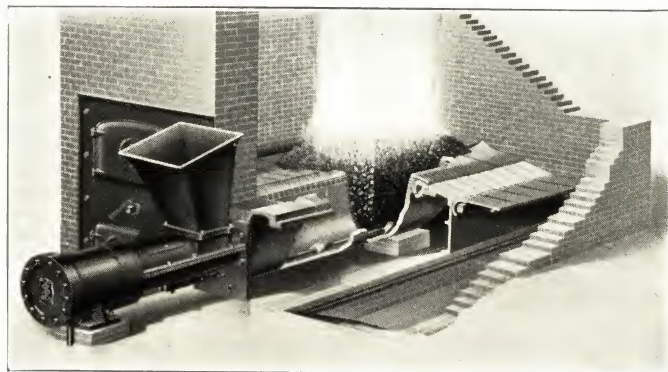
SERVICE.

*The Under-Feed Stoker Company of Canada, Ltd., replaces the former Jones Under-Feed Stoker Co., Ltd. The reorganization preserves the experience of the older organization and adds the engineering resources of the Under-Feed Stoker Co. of America. Jones Stokers are made in Canada by Canadians and are sold for Canadian money at par. The experience of this company will be directed to the solution of any problems involving the possible use of stokers. No obligation of course.



SECTIONAL VIEW THROUGH JONES "A-C" STOKER, SHOWING COUNTER BALANCED DUMP PLATE IN POSITION.

The "A-C" (Automatic-Cleaning) heavy duty Stoker—sustains heaviest overloads and peak loads. No size limit to load or boiler served. Ask for "A-C" catalogue.



The "Standard Side-Dump" (Self-Cleaning) Stoker. Single retorts suit boilers to 300 H.P. Fuel capacity to 1800 lbs. per hour. Easily installed in existing plants. Ask for catalogue.



The "Standard" Stoker has fuel burning capacity to 1500 lbs. hourly. Single units suit boilers to 200 hp. More "Standard" Stokers are used for H.R.T. Boilers than all other makes combined. Used for industrial heating furnaces. Described in catalogue.

505 YORK BLDG., TORONTO.

CRAIG DAMPER REGULATOR CO., OF CANADA, LIMITED.

146-152 KING STREET, WEST, TORONTO, ONTARIO.

CASH STANDARD PRESSURE REDUCING AND REGULATING VALVES.

PRODUCTS.

CASH SINGLE-SEAT DIAPHRAGM TYPE PRESSURE REDUCING AND REGULATING VALVES.
DOUBLE SEAT REDUCING AND REGULATING VALVES.
OUTSIDE AUXILIARY CONTROL REDUCING AND REGULATING VALVES.
AUXILIARY TYPE PRESSURE REDUCING AND REGULATING VALVES.
AUTOMATIC AMMONIA EXPANSION VALVES.
AMMONIA CONTROLLED WATER REGULATORS.
DIAPHRAGM RELIEF VALVES OR BACK PRESSURE RELIEF VALVES.
AUTOMATIC AND EMERGENCY CUT-OFF VALVES.
GLOBE TYPE RELIEF VALVES. ANGLE TYPE RELIEF VALVES.
ANGLE TYPE EXHAUST RELIEF VALVES.
PUMP GOVERNORS. FAN ENGINE REGULATORS.
PRESSURE AND VACUUM RELIEF VALVES.
STRAINERS (CYLINDRICAL AND FLAT TYPES) AND SPECIAL VALVES.

OPERATION.

The action of the Class D Regulator typifies the general operation of all Cash Regulators. Note the drawing opposite.

Assume that the initial pressure is 100 lbs. and that the valve is set to deliver 40 lbs. As soon as the delivery pressure exceeds 40 lbs., its action on the under side of the diaphragm will raise the diaphragm spring and permit the valve proper to close to the point where proper reduction is effected. When the delivery pressure falls, the action of the diaphragm spring will force the valve open to the proper point to restore the required reduction.

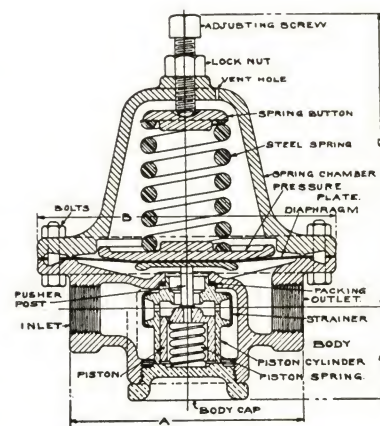
There are of course no abrupt movements. In normal service the valve seat merely assumes a floating position.

ADVANTAGES.

SELF-CONTAINED STRAINER, heads off damaging foreign substances right at valve seat. WIRE DRAWING ELIMINATED because of wide opening of valve necessary to pass required volume. CLOSURES WITH HIGH PRESSURE—Valve closes with pressure behind it. NO SEIZING OR STICKING because working parts expand and contract evenly. ACCESSIBILITY—Working parts easily removed. SIMPLICITY—One simple working unit, no levers, bearings, packing, external dash pots or other delicate parts.

RANGE OF
SERVICE.

Single-Seat Regulators are for lines from $\frac{1}{8}$ " to 2" (all sizes) and initial pressure to 300 lbs.—reduced pressure to 150 lbs. Double-Seat Regulators for higher pressures made in standard sizes from 2 to 4 inches. Other special types for all services and conditions described in large catalogue. Cash engineers will solve special problems.



CLASS D SINGLE SEAT REDUCING AND
REGULATING VALVE.

THE CRAIG SYSTEM OF BETTER DRAFT CONTROL.

PRODUCT.

The Craig Regulator, for automatically maintaining a given draft over the fire, insuring highest combustion efficiency.

OPERATION.

The diagram shows the operation of the Craig Regulator. The rising and falling of the bell float (A), which is affected by changes in pressure over the fire, carried to the underside of the float by pipe (H) actuates the control valve (M). The moving control valve opens and closes the ports (U) permitting the water pressure from the pipe (W) to move the piston and its wire rope which regulates the damper as shown.

ADVANTAGES.

Though simple, this mechanism meets every condition necessary for ideal draft regulation—regulation within two hundredths of an inch of the draft for which it is set.

Its basic principle is correct—it operates on volume flow of gases and not on steam pressure.

It opens the damper quickly and closes it slowly. For note that each port is several times larger than the water supply pipe; so when the control valve rises the water rushes through the opened ports, causing the piston to rise quickly, opening the damper rapidly. Again, when the control valve drops the reverse is true. Quick opening permits quick pick-up for overloads; slow closing prevents a flapping effect of the damper or plus pressures over the fire when the load drops off suddenly. Only a very small amount of water is used in the operation of the Craig Regulator. Friction is minimized, for the control valve has a comparatively loose fit and the only friction (caused by the small sheave wheel) is negligible. This explains the great sensitiveness, and the accuracy of draft control.

The Craig System permits carrying the minimum draft for the required combustion rate—carrying it automatically and continually. Minimum draft means minimum air leakage, high furnace temperature, greater heat absorption, and consequently higher CO₂ and greater fuel economy.

SAVING.

The Craig System increases the CO₂ from 1% to 3%, depending on plant conditions. This means a fuel saving which will make a substantial return on the investment. Special service is rendered by Craig engineers. Details are given in catalogue.

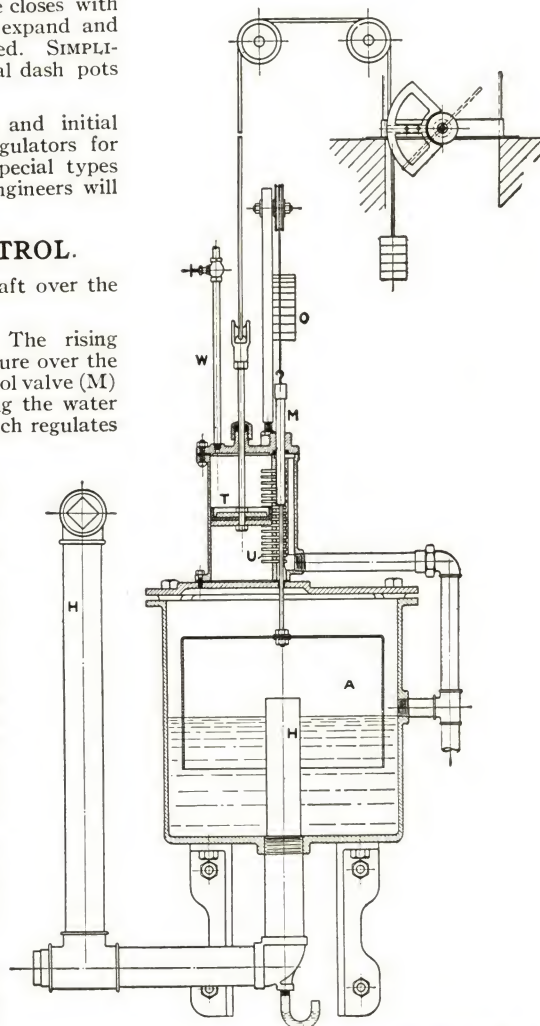


DIAGRAM SHOWING CONSTRUCTION AND OPERATION OF
CRAIG DAMP REGULATOR.

ESTABLISHED 1867.

THE VILTER MANUFACTURING CO.

MANUFACTURERS OF ICE MAKING AND REFRIGERATING MACHINERY, STEAM ENGINES, Etc.

MAIN OFFICE AND WORKS: 845-863 CLINTON STREET,
MILWAUKEE, WISCONSIN, U.S.A.

PRODUCTS.

VILTER HIGH SPEED AMMONIA COMPRESSORS.

VILTER ICE MAKING AND REFRIGERATING MACHINERY; AMMONIA VALVES AND FITTINGS; AMMONIA CONDENSERS; BRINE COOLERS; VILTER ROLLING MILL AND GIRDER FRAME CORLISS ENGINES; POPPET VALVE ENGINES.

All accepted principles of refrigerating machinery construction, and all subsequent, consistent developments and improvements find embodiment in Vilter Horizontal High Speed Ammonia Compressors. They are specially designed for direct connection to the newest types of high speed prime movers, and particularly adapted for direct connection to synchronous motors, a method of drive which is proving so highly economical and efficient.

VILTER ROLLING MILL TYPE COMPRESSOR.

A horizontal double acting ammonia compressor, with rolling mill frame. Its very appearance gives assurance and proof of its strength and durability. All parts of the base rest upon the foundation, giving a uniform distribution of the load and insuring maximum stability and rigidity. Stuffing box of the double packed type, with oil seal and pressure release. Inlet and outlet valves located in cylinder heads, and designed to obtain maximum area. Simple compressors built direct connected to Corliss engines, in sizes from 6 to 400 tons refrigeration per 24 hours; also direct connected to tandem compound Corliss and poppet-Corliss engines in sizes from 100 to 400 tons refrigeration per 24 hours. Duplex compressors built direct connected to cross compound Corliss or poppet-Corliss engines in sizes from 100 to 800 tons refrigeration per 24 hours. Also in simple or duplex arrangement for belt or rope drive from electric motors or other type of prime movers.

VILTER LOW TEMPERATURE COMPRESSION SYSTEM.

A system for efficiently producing extremely low temperatures with compression refrigerating machinery, by means of multi-stage compressors and liquid cooling, which reduces the power per ton of refrigeration. Send for special literature.

VILTER SMALL CAPACITY TWIN CYLINDER AMMONIA COMPRESSORS.

A vertical single acting compressor specially designed for users of comparatively small quantities of refrigeration. Staunchly built, with a view to operation with a minimum amount of attention. Built in sizes from 1 ton to 20 tons capacity per 24 hours.

VILTER CORLISS AND POPPET VALVE ENGINES.

The rolling mill frame Corliss engine is of exceptionally massive construction and adapted to any class of service, from the steady belted load to direct connected electric service, in which the engine is subjected to heavy and extremely variable loads. Built for high steam pressures and high rotative speeds. The valve gear is of the high speed type, and all valves are double ported. Built in all sizes, either simple, tandem compound, or cross compound.

The girder frame Corliss engine is strong and rigid and designed to take shocks and overloads without possibility of misalignment. Adapted to any class of ordinary service, and recommended for steam pressures up to 100 lbs. Made in 26 sizes, from 25 H.P. up.

The poppet valve engine operates with high steam pressures and superheat, and is remarkable for its low steam consumption. Valve gear is of special design, reducing the number of working parts to about 60% of the number used in other designs.

AMMONIA FITTINGS, Etc.

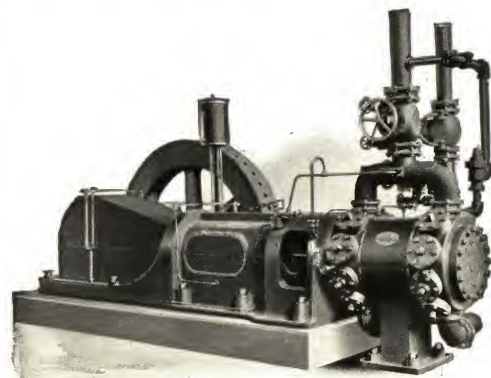
A full line of ammonia valves and fittings, condensers, separators, receivers, brine coolers, etc., to fill any requirements.

CANADIAN REFERENCES.

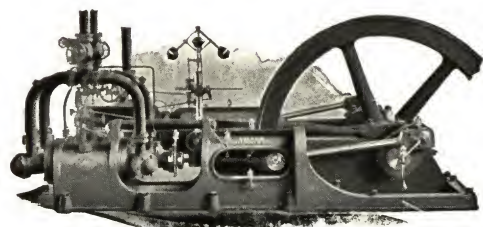
We have installed complete plants, from the smallest to the largest, in all parts of the Dominion. Send for name of user in your vicinity.

LITERATURE.

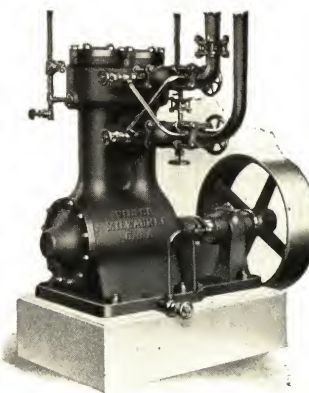
Bulletins, catalogues, and full data regarding our products will be mailed on request.



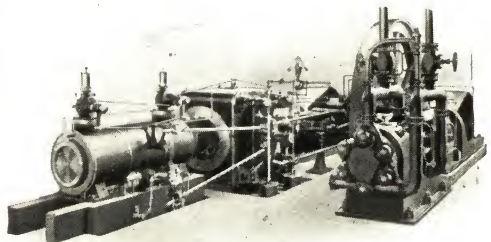
VILTER HIGH SPEED AMMONIA COMPRESSOR.



VILTER DUPLEX AMMONIA COMPRESSOR, DIRECT CONNECTED TO CROSS COMPOUND CORLISS ENGINE.



VILTER TWIN CYLINDER AMMONIA COMPRESSOR, SMALL CAPACITY.



SIMPLE COMPRESSOR, DIRECT CONNECTED TO TANDEM COMPOUND ENGINE WITH HIGH PRESSURE POPPET VALVE CYLINDER AND LOW PRESSURE CORLISS CYLINDER.

CANADIAN ICE MACHINE CO., LIMITED

HEAD OFFICE: TORONTO.
MONTREAL, WINNIPEG AND VANCOUVER.

"YORK" ICE MACHINES.

"CIMCO" SUPPLIES.

PRODUCT.

REFRIGERATING AND ICE MAKING MACHINERY AND SUPPLIES, with other Special Apparatus for lowering and holding constant Temperatures and Humidities.

TYPE OF EQUIPMENT.

Sizes in Single Units from $\frac{1}{4}$ to 600 tons Ice Melting Capacity per 24 hours, in following types, suitable for all Ordinary and Special Purposes:—

BRINE
OR
DIRECT
EXPANSION
SYSTEM.

YORK
AMMONIA
COMPRESSION
MACHINES.

YORK
CARBONIC
ACID
MACHINES.

YORK
AMMONIA
ABSORPTION
MACHINES.

VERTICAL COMPRESSORS.
HORIZONTAL COMPRESSORS.
HIGH SPEED
ENCLOSED COMPRESSORS.

VERTICAL COMPRESSORS.
HORIZONTAL COMPRESSORS.

LIVE STEAM.
EXHAUST STEAM.

DIRECT
CONNECTED ON
COMMON
BASEPLATE
OR
BELTED
TO.

DOUBLE PIPE.
SHELL AND COIL.
SHELL AND TUBE.

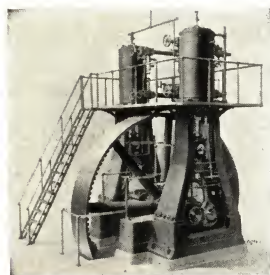
YORK
STEAM ENGINES:
SLIDE VALVE.
PISTON "
CORLISS "
POPPET "
POPPET UNIFLOW.
ELECTRIC MOTOR.
INTERNAL
COMBUSTION ENGINE.

IN FOLLOWING INDUSTRIES:—

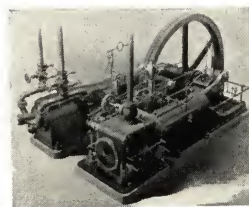
ICE MAKING.
DAIRIES.
CREAMERIES.
ABATTOIRS.
BREWERIES.
BOTTLING WORKS.
HOTELS.
RESTAURANTS.
FISH FREEZING.
PRODUCE STORES.
DEPARTMENTAL STORES.
CONDENSING PLANTS.
SUGAR REFINERIES.
OIL REFINERIES.
SALT REFINERIES.
CHOCOLATE AND CANDY.
GLUE FACTORIES.
DYE WORKS.
PAINT WORKS.
PARAFFINE WORKS.
DRUG MFG.
TOBACCO AND CIGAR.
TEXTILE INDUSTRIES.
VINEGAR MFG.
ISINGLASS.
INK MFG.
SILK MFG.
SKATING RINKS.
SHAFT SINKING.
MORGUES.



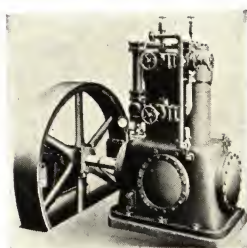
VERTICAL HIGH SPEED COMPRESSOR AND SLIDE VALVE ENGINE.



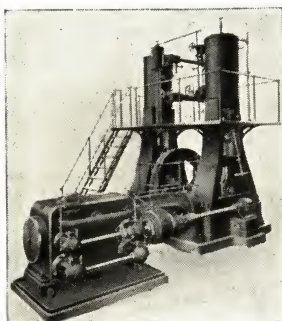
VERTICAL COMPRESSOR BELTED.



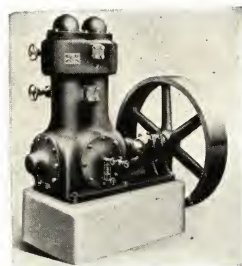
HORIZONTAL COMPRESSOR WITH CORLISS ENGINE.



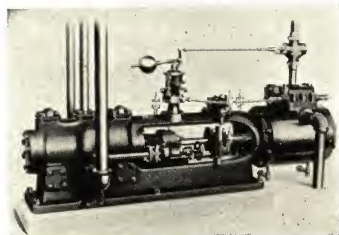
VERTICAL HIGH SPEED BELTED COMPRESSOR.



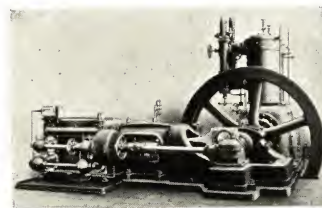
VERTICAL COMPRESSOR WITH POPPET VALVE ENGINE.



VERTICAL HIGH SPEED BELTED COMPRESSOR.



AQUA AMMONIA PUMP.



VERTICAL HIGH SPEED COMPRESSOR WITH UNIFLOW ENGINE.

PACKING HOUSES.
MEAT MARKETS.
CANNING.
LEATHER MFG.
YEAST MFG.
SOAP MFG.
CHEESE MFG.
GELATINE WORKS.
CHEMICAL WORKS.
DRINKING WATER SYSTEMS.
PUBLIC BUILDINGS.
HOSPITALS.
MEDICAL TREATMENT.
STEAMSHIPS.
FISHING BOATS.
DREDGES.
BAKERIES.
CIDER MFG.
MINERAL WATER.
SYRUP MFG.
MALT EXTRACTS.
PERFUMERY MFG.
CANDLE MFG.
EXPLOSIVE MFG.
FLORISTS.
NURSERYMEN.
STEEL WORKS.
CELLULOID WORKS.
ALUMINIUM WORKS.
PHOTO. MATERIAL.

SERVICE.

We maintain an efficient service corps and carry a complete line of "CIMCO" supplies in stock for the convenience of our customers.

THE WM. RUTHERFORD & SONS CO., LIMITED

LUMBER AND MILLWORK

ASBESTOS AND MAGNESIA PRODUCTS

425 ATWATER AVENUE
MONTREAL, QUE.

SOLE DISTRIBUTERS IN QUEBEC AND MARITIME PROVINCES FOR CAREY PRODUCTS.
PIPE AND BOILER COVERING CONTRACTS UNDERTAKEN IN ALL PARTS OF THIS TERRITORY.

ROOF COATING.

Carey
FIBRE
COATING

CAREY FIBRE COATING is made from a pure elastic asphalt compound, preservative oils and Asbestos rock fibre. The result is a heavy reinforced coating that will not run, crack or blister like ordinary paint and is acid and alkali proof. With one application of CAREY FIBRE COATING, metal roofs of every description can be repaired and protected for a number of years; and old worn-out felt, composition and rubber roofing can be made practically as good as new. 100 square feet of roofing requires one and a half to two gallons of Fibre Coating, depending on condition of same.

ASPHALT PAINT.

Carey
BLACK
ASPHALT
PAINT

CAREY BLACK ASPHALT PAINT is made from high grade asphalts and preservative oils, and is especially made for coating exposed metal work, interior or exterior, such as steel tanks, structural iron, metal roofing, pipe lines, iron doors and shutters, fire escapes, etc. Carey Black Asphalt Paint contains an elastic asphalt that contracts and expands with the metal. It fills all pin-holes and protects the surface against the action of rust. It is supplied in both Quick and Slow Drying qualities. One gallon will cover from 200 to 300 square feet of metal surface, depending on condition of same.

EXPANSION JOINTS.

CAREY
Elastite
EXPANSION JOINT

CAREY ELASTITE EXPANSION JOINT consists of a heavy body of asphaltic compound, inseparably bonded between two walls of asphalt saturated felt. Elastite is made in widths, lengths and thicknesses as required, and comes to the job ready to use. It saves time and labour, eliminates waste and absolutely prevents a faulty job, either from carelessness or oversight. It ensures full depth joints, provides for all temperature changes, requires no investment in equipment, and reduces labour costs. Elastite Expansion Joints are used effectively in all types of concrete work, in fact in any construction work where it is necessary to provide for expansion of materials.

PIPE COVERING.

Magnesia and
Asbestos
INSULATING

The following Carey Pipe Coverings are specially designed to give the highest possible efficiency:—

1. CAREY 85% MAGNESIA COVERING.—For medium, high pressure and superheated steam lines where maximum economy is desired
2. CAREY PYREX ASBESTOS COVERING.—For steam lines subject to excessive vibration or rough usage.
3. CAREY CAROCEL COVERING.—For low pressure steam and hot water lines.
4. CAREY ASBESTOS AIRCELL COVERING.—For low pressure steam and hot water lines, where price must be restricted.
5. CAREY IMPERVO COVERING.—For cold pipe lines to prevent sweating, and ice water line insulation
6. CAREY PTOTECTO COVERING.—For cold water lines to prevent freezing.
7. CAREY ARGENTUM COVERING.—For steam or hot water lines exposed to moisture or the weather.
8. CAREY SYSTEM FOR UNDERGROUND INSULATION.—For underground steam pipes.

OTHER CAREY PRODUCTS.

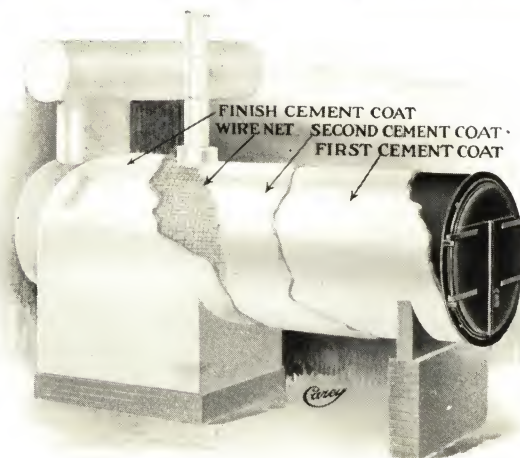
ROOFINGS.—Built-up and Ready Roofings made of either asphalt saturated asbestos or rag felt

WATERPROOFING.—For all structures subjected to water or dampness.

CEMENTS.—B.T.U. Boiler Setting Cement and Retort Cements.

ASPHALTS.—High and low melting point asphalts for roofing and other purposes.

See also our Advertisement, page 52.



85% MAGNESIA BLOCK AND CEMENT—THE BEST COVERING FOR INSULATING BOILERS.

ARMSTRONG CORK & INSULATION COMPANY, LIMITED

901 MCGILL BUILDING,
MONTREAL.

11 BRANT STREET,
TORONTO.

INSULATING MATERIALS.

NONPAREIL CORKBOARD, FOR COLD STORAGE INSULATION.

To meet the demands of modern cold storage construction, a good insulating material must be:

- A good non-conductor of heat.
- Non-absorbent of moisture and therefore durable in service.
- Sanitary and odourless.
- Compact—occupying but little space.
- Structurally strong and therefore easy to install.
- Slow burning and fire-retarding.
- Reasonable in cost.

NONPAREIL CORKBOARD meets these requirements to a greater degree than any cold storage insulation that has yet been devised, for in cork, nature herself has supplied a material particularly well-suited for this purpose.

Use NONPAREIL CORKBOARD for the insulation of Cold Storage Warehouses, Ice Plants, Breweries, Packing Plants, Fur Storage Vaults, Dairies, Creameries, Ice Cream Plants, Refrigerators, Freezing Tanks, etc.

NONPAREIL CORK COVERING.

NONPAREIL CORK COVERING, for cold pipes, is designed especially for the insulation of brine, ammonia, ice water, beer and cold water lines, accumulators, coolers, cylindrical tanks and filters. It consists of pure granulated cork, compressed and baked in moulds of proper shape to fit the different sizes of pipes and the various fittings in ordinary use. It is coated inside and out with mineral rubber finish and is applied with waterproof cement on the joints, thus rendering them impervious to moisture.

Nonpareil Cork Covering is manufactured in four thicknesses to meet different service conditions.

NONPAREIL HIGH PRESSURE STEAM COVERING.

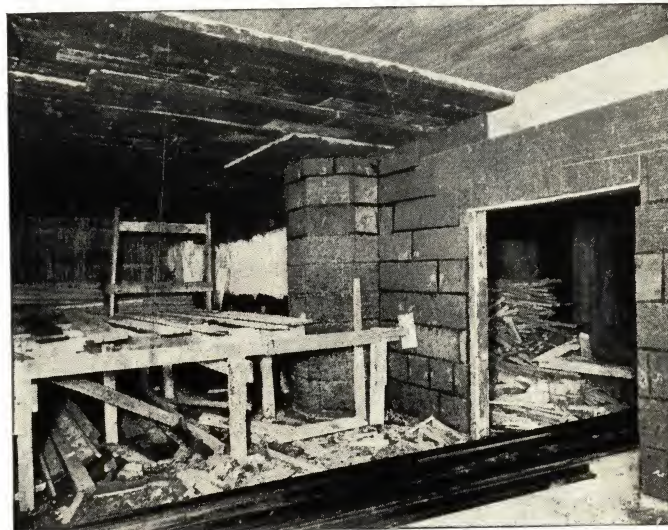
The increasing tendency to use steam at high pressure and the growing popularity of superheated steam, has created a demand for a more efficient type of insulation for steam lines—a demand which is fully met by Nonpareil High Pressure Covering. This Covering is distinctive because it is the only covering made of diatomaceous earth and asbestos.

Compared with other high pressure covering, Nonpareil High Pressure Covering is not only a better non-conductor of heat, but will withstand higher temperatures without calcining or disintegrating. Moreover, it will bear repeated wetting and drying without injury, and for this reason is the ideal form of insulation for underground steam lines. It is easy to apply and reasonable in price.

NONPAREIL INSULATING BRICK.

For many years there has existed a real need for a heat insulating material which would combine low heat conductivity with sufficient strength to enable it to be built in as part of the structure it is designed to insulate. Nonpareil Insulating Brick fulfill all these requirements; they will withstand a crushing load of more than ten tons to the square foot and their insulating efficiency is exceptionally high. They are easy to install, being made in standard size $9" \times 4\frac{1}{2}" \times 2\frac{1}{2}"$.

Nonpareil Insulating Brick are especially suitable for the insulation of boiler settings, furnaces, bake ovens, gas plants, enamelling ovens, etc.



INSTALLATION OF NONPAREIL CORKBOARD.

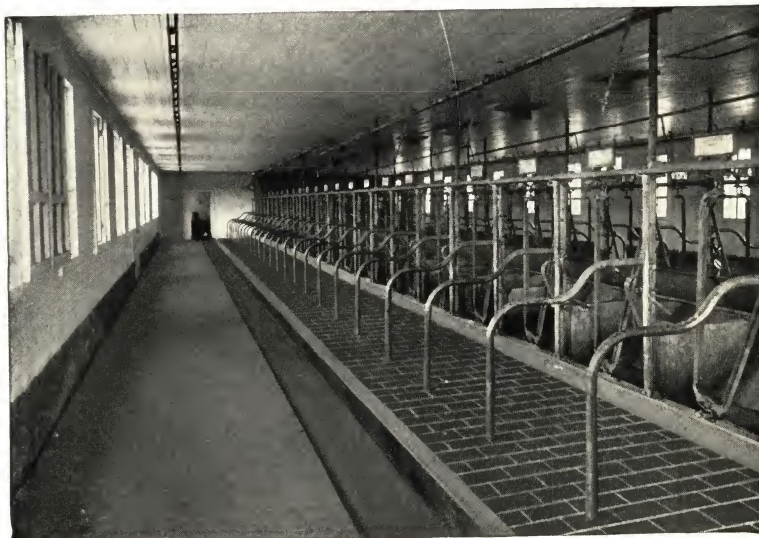
CORK TILE FLOORS.

Cork Tile is composed solely of cork, no foreign binder is used in its manufacture. It is furnished in three shades, light, medium and dark brown. Cork Tile is durable, sanitary, non-slippery, warm and noiseless to the tread. Cork Tile is used in Banks, Court Houses, Hospitals, Libraries, Churches, Theatres, Offices, etc.

CORK BRICK.

An ideal material for flooring cow stalls, calf, bull and sheep pens, piggeries, etc.

Cork brick is composed of clean granulated cork and refined asphalt. The mixture is heated, moulded into brick form $9 \times 4 \times 2$ inches and then subjected to heavy pressure. It is warm to the touch—summer and winter—easy under foot, never slippery—wet or dry—non-absorbent and thoroughly sanitary, durable in service and easy to install in old or new barns.



CORK BRICK.

LINOTILE FLOORS.

Linotile is a composition in which powdered cork, wood flour and linseed oil predominate. It comes in tile form, one-quarter inch thick, and in various shapes and sizes. It is applicable to any base—wood, concrete or metal. There are eleven colours and almost any design can be made to suit requirements.

Linotile is a flooring material which combines the durability of concrete, the qualities of marble and the attractiveness of glazed tile. The combination of all these features makes Linotile an ideal flooring for Offices, Stores, Churches, Banks, Lobbies, Billiard Rooms, Kitchens, Pantries, etc.

THE CANADIAN KELLOGG CO., LIMITED

MONTREAL OFFICE:
84 ST. ANTOINE STREET.

MANUFACTURERS OF PERFORATED RADIAL BRICK CHIMNEYS.

140 CEDAR STREET, NEW YORK, N.Y.

TORONTO OFFICE:
ARTHUR S. LEITCH CO.,
KENT BLDG., TORONTO.

PRODUCTS.

SERVICE.

KELLOGG PERFORATED RADIAL BRICK CHIMNEYS.

STANDARD SPECIFICATIONS FOR PERFORATED RADIAL BRICK CHIMNEYS.

PERFORATED RADIAL BRICK CHIMNEYS.

THE CANADIAN KELLOGG COMPANY has erected some of the finest chimneys in Canada and the United States during the last twenty years, and is ready to share the results of that experience with engineers and architects who are engaged in problems where chimney construction is required. This company's engineers will be glad to advise on types, sizes, shapes, etc., of chimneys for any condition that may arise.

No artificially produced material for the construction of the modern factory chimney compares with refractory clay. This raw material is put through a variety of scientific treatments by skilled hands and especially designed machines before it comes from the kilns in the form of perforated radial brick ready for shipment, and for use in chimney construction.

Each brick is formed to occupy a certain position in the circular and radial lines of the chimney, as shown by the drawing on this page, and is sound ringing, hard and well burned.

Bricks are made to conform closely with the circular and radial lines of the shaft and are weather- and acid-proof.

Total amount of perforations does not exceed one-fourth of the cross area of the brick, which are tested to a crushing strength of not less than 6,000 lbs. per sq. in.

The perforations in the radial bricks form a dead air space about the core of the chimney. This has a marked effect in reducing amount of fuel used, in preventing sudden changes of temperature within the chimney, and in reducing radiation. Thus a uniformly maximum draft is maintained in any kind of weather.

A trained superintendent of construction, familiar with all the details of the plans and specifications of the chimney, accompanies the shipments of radial brick, to supervise unloading and stacking in the order of their use. Throughout the entire construction the bricks of each tier reach their final place under his direction.

An expert mortar man supervises the preparation and use of all of the mortar. The tensile strength of the chimney, its ability to withstand heat and cold and to defy all sorts of weather from without and all sorts of gases from within, depend largely upon this mortar. Each brick is laid in so full a bed of mortar that the latter enters the perforations of the brick from 1 in. to 1½ ins. The joints are struck both inside and out.

A crew of trained men in scientific chimney construction carry forward the erection of the chimney from start to finish, insuring careful construction and the proper grading and matching of brick throughout.

For the convenience of Architects or Engineers wishing to write a specification for a modern chimney we have prepared the following:

SCOPE—The work included under this contract is to consist of all labor and material necessary for the erection complete of one radial brick chimney in accordance with this specification, which shall become a part of the contract. The proposal shall include all scaffolding, cartage, unloading of material and removal of rubbish necessary to leave the chimney in a first class condition ready for operation.

DELIVERY—The chimney will be built at located on the railroad.

Material may be unloaded on owner's siding, which is within of the chimney site.

SPACE—Sufficient storage room for chimney contractor's materials will be provided adjacent to chimney as well as unobstructed access from transportation delivery to the site of chimney for delivery and removal of materials and tools. At least one side of chimney will be left free and open by the owners for hoisting and working space until the chimney is completed.

WATER—The owners will provide the chimney contractor with necessary water within 50 ft. of the site of the chimney free of expense to the chimney contractor. From this point the chimney contractor will make his own hose connections, if required.

WORKMANSHIP AND MATERIALS—All workmanship and materials shall be first class.

The chimney contractor shall furnish a competent foreman under whose supervision the chimney will be built. Chimney must be built in a thorough, complete and workmanlike manner.

TIME OF COMPLETION—The chimney contractor shall state in bid the guaranteed number of working days in which he will finish the chimney after receipt of signed contract and approved drawings.

FOUNDATION—Proper foundation will be built by the owner from plans and specifications to be furnished by the chimney contractor, who will, upon completion, give in writing his approval of the foundation as being sufficient to sustain the chimney and fulfil the guarantee.

Note—In case, however, it is desired to have chimney contractor build the foundation, the following may be used:

The chimney contractor shall furnish a concrete foundation of proper depth and spread to safely sustain the chimney. The foundation shall be not loaded to more than tons per sq. ft., which is the safe bearing value as determined for this work.

Excavating shall be done by contractor for foundation.

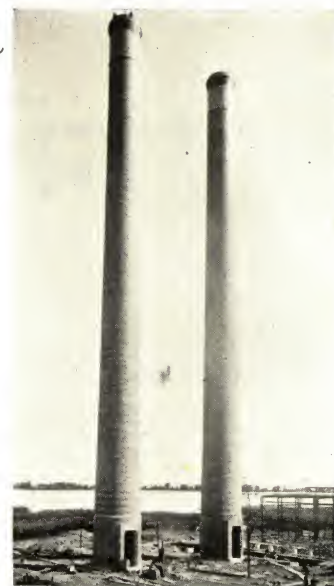
The concrete shall be composed of cement, sand, stone or gravel in the proportion of 1 part cement to 2½ parts sand and 5 parts of stone or gravel. It shall be deposited in the forms in layers not to exceed 6 in. in thickness and thoroughly rammed into place. Concrete shall be a wet mixture.

DESIGN—The design of the chimney shall conform to the following dimensions as shown on drawing attached:

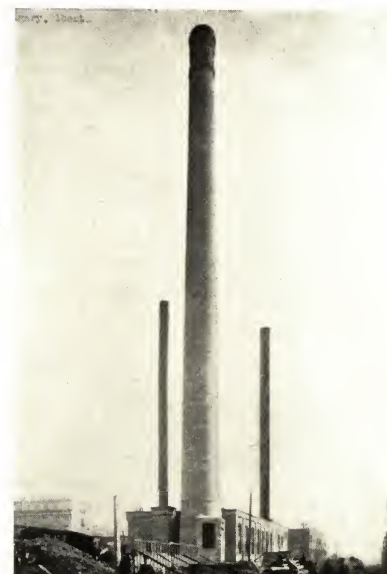
Height above top of foundation ft. ins.

Minimum internal diameter ft. ins.

The wall of the column shall have one straight and true batter from top to bottom. The wall thickness and section lengths to be as shown on drawing. In case the contractor's standard wall thickness should not be exactly as shown, a variation of 3% will be allowed in either direction.



DOMINION POWER CO., HAMILTON, ONT.
250' x 12'.



CANADIAN PACIFIC RAILWAY—CALGARY HOTEL
200' x 10' TOP DIAM.

**STANDARD
SPECIFICATIONS
FOR PERFORATED
RADIAL BRICK
CHIMNEYS—
(Continued).**

BASE—If chimney is to be built with base and column construction, use the following:
The base of the chimney shall be built [here fill in shape of base] in shape ft. high, of the dimensions shown on drawing, of straight, hard, well burned, well shaped common building brick laid in full bed of cement lime mortar as herein specified.

Note—If round for the entire height, specify as follows:

The chimney shall be built of perforated radial brick for the entire height, as hereinafter specified.

RADIAL BRICK—All radial brick shall be best quality, moulded from refractory clay, sound ringing, hard, well burned, well shaped, of reasonably even color; made to closely conform with the circular and radial lines of the shaft, and shall be weather- and acid-proof. They shall have a water absorption of not less than 5% nor more than 12% of their dry weight after immersion for a period of 24 hours; and shall have a crushing strength of not less than 6000 lbs. per sq. in. The total amount of perforations shall not exceed one-fourth of the cross area of the brick. One cu. ft. of radial brickwork shall weigh not less than 120 lbs. The outside faces of the brick shall be of regular size, so that the general appearance of the brickwork will be neat and uniform.

LINING—The chimney shall have an expansion lining built of perforated radial fire brick $4\frac{1}{4}$ ins. thick, ft. high from a point 2 ft. below the bottom of the flue opening. The lining prevents flue gases from coming in contact with the solid masonry of which the shell is built, and shall be separated from same by an air space of not less than 2 ins.

The lining shall be built after the chimney is finished, and exceptional care must be taken to keep the air space clear and free of loose mortar and other dirt.

Rack out the shell of the chimney approximately 2 ins. above lining, to form a ledge for the purpose of diverting the falling soot when the chimney is in operation.

MORTAR—All brickwork shall be laid in cement lime mortar, as hereinafter specified, with courses level and with full joints throughout. Face brickwork and backing to be laid up at the same time with joints of reasonably even thickness, not exceeding $\frac{1}{2}$ in. The mortar to be used in the chimney shall consist of 1 part Portland cement, 2 parts fresh burnt limp lime mortar and 5 parts clean, sharp sand. The cement to be added to the sand and lime mortar as the mortar is required, and no mortar having taken an initial set is to be used. The cement must not be added until the lime is cool. The sand shall be clean and sharp, free from loam, vegetable matter and large pebbles. If necessary, it must be both screened and washed.

BOND—All common brickwork shall have every fourth course a header course.

Radial brickwork shall be bonded every three courses.

BREECHING OPENING—One opening shall be provided in chimney. The opening to be lined on the reveals with refractory material. The masonry above the opening to be supported by heavy I-beams set on steel plates, with air spaces at each end for expansion. Under these I-beams a flat masonry arch shall be built to properly protect the beams from the effect of the gases. The flue opening shall be reinforced laterally by heavy tie rods and plates over the top and at the bottom.

Three-eighths by 3-in. steel bands to be placed in the masonry above and below opening.

The opening shall be wide by high, the bottom of which shall be approximately above foundation.

REINFORCING RINGS—The chimney contractor shall place in the brickwork at every change in wall thickness steel bands $\frac{3}{8}$ in. thick by 3 ins. wide.

If the contractor should furnish perforated radial brick having corrugated sides, these bands may be omitted.

HEAD—The head of the chimney shall be neatly corbeled out and fitted with a heavy annular retaining ring set in full bed of cement mortar.

CLEAN-OUT DOOR—Provide and place in base of chimney where directed by owner a cast iron clean-out door and frame properly hinged and fitted with latch. Said door to be approximately 24 ins. wide by 36 ins. high.

LADDER—Build on the interior of the chimney a ladder to consist of $\frac{3}{4}$ -in. galvanized iron rungs, spaced approximately 15 ins. center to center and securely anchored to the masonry from top to bottom. These ladder irons to be in the shape of a "U" with hooked ends.

LIGHTNING CONDUCTOR—The lightning conductor is to consist of copper points, $\frac{3}{4}$ in. in diameter by 8 ft. long, with $1\frac{1}{2}$ -in. platinum tips. The points to be anchored to the top of the column and extend from the bottom of the corbeling upward. The lower ends of the points to be connected by a loop of copper cable encircling the chimney. From this loop there is to be $1\frac{1}{2}$ -in. 7-strand No. 10 Stubbs' wire gauge copper cable, carried down the side of the chimney and connected to copper ground plate of the 3-winged type as best for the proper distribution of charge. The points to be securely fastened to the top of the chimney and the cable to be anchored every 7 ft. in height with brass anchors, so designed that they will support the weight of the cable. The ground plate shall be buried by the contractor for the foundation when it is built.

LETTERING (WHEN DESIRED)—Work into the column on [one or two] sides as directed the letters [here insert the desired legend] to be made in permanently colored kiln burnt brick. Letters to be true to size and shape and to be in a true vertical line.

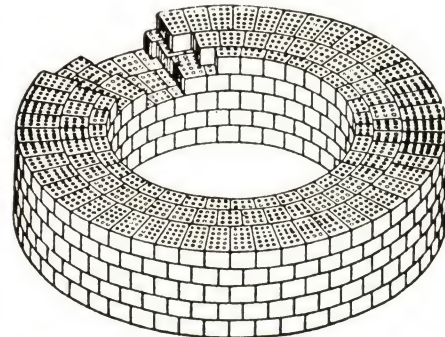
TRIMMINGS (IF ANY)—All necessary stone or terra cotta shown on drawing will be furnished without charge by the building contractor to the chimney contractor, who will set same. No one piece should weigh over 200 lbs.

INSURANCE—The chimney contractor shall carry at his own expense, during the entire period of construction, liability insurance, insuring the men in his employ and the public in general, in case of damage due to accidents.

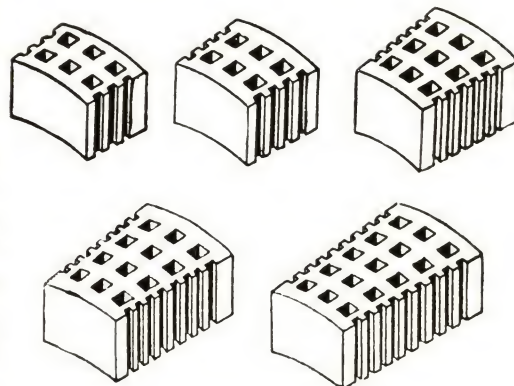
GUARANTEE—The chimney contractor shall guarantee the chimney for a period of 5 years from date of completion. The guarantee shall cover any defects that may arise within this period due to faulty design, construction, material, weather, and the products of combustion up to 800° Fahr.; and shall further guarantee to make good at his own expense all defects that may arise from any of the above conditions within the specified period.

The chimney shall be designed for a wind velocity of not less than 100 miles per hour.

NOTE—The chimney shall be built according to THE CANADIAN KELLOGG COMPANY, LTD. [or equal] system of construction. The insertion of this clause would be greatly appreciated on account of the advertising value to us on future work.



METHOD OF USING KELLOGG'S PERFORATED RADIAL BRICK IN CHIMNEY CONSTRUCTION.



REFERENCES.

ONTARIO:

Brunner, Mond, Ltd.
Brunner, Mond, Ltd.
Canadian Copper Co.
Canadian Copper Co.
International Harvester Co.
Dominion Power & Transmission Co.
Mattagami Pulp & Paper Co.
St. Michael's Hospital.
Lever Brothers Limited.
Palmolive Co. of Canada, Ltd.

QUEBEC:

Wayagamack Pulp & Paper Co.
The Ha Ha Bay Sulphite Co., Ltd.
Brompton Pulp & Paper Co. (1st order).
Brompton Pulp & Paper Co. (2nd order).
Can. Pacific Ry. Co., Place Viger, Montreal.
McDonald College.
Shawinigan Cotton Mills.

ALBERTA:

Canadian Pacific Railway Co., Calgary.
City Incinerator, Calgary.
Canada Malting Co., Calgary.

SASKATCHEWAN:

City Incinerator, Moose Jaw.
Saskatoon Destructor, Saskatoon.

MANITOBA:

Insane Asylum, Brandon.
Canadian Pacific Railway Co., Transcona.
Winnipeg Electric Railway Co., Winnipeg.
T. Eaton Co., Winnipeg.

NEW BRUNSWICK:

Can. Pacific Ry. Co. (Algonquin Hotel).
Atlantic Sugar Refineries.
T. McAvity & Sons, Ltd.

GRINNELL COMPANY OF CANADA, LIMITED

TORONTO, ONT., 2440 DUNDAS ST. WEST.
WINNIPEG, MAN., 910 SOMERSET BLDG.

MONTREAL, QUE., 370 BEAUMONT AVE.
VANCOUVER, B.C., 1140 HAMILTON ST.

PRODUCTS.

GRINNELL AUTOMATIC SPRINKLER SYSTEMS, STEAM AND HOT WATER HEATING EQUIPMENT, POWER PIPING INSTALLATIONS, WROUGHT, CAST IRON AND BRASS PIPING, FITTINGS, HANGERS, VALVES, Etc.

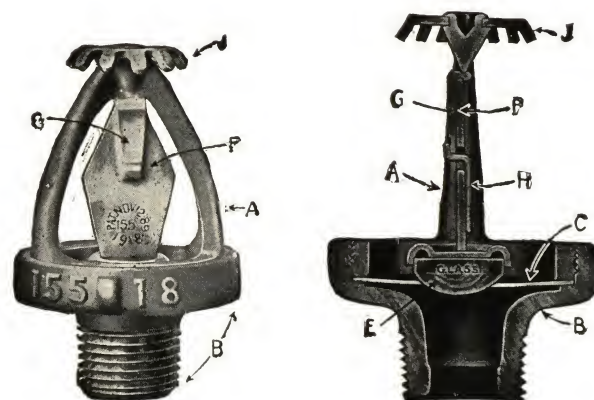
GRINNELL AUTOMATIC SPRINKLER SYSTEM.

Before the invention of automatic sprinklers the average loss per fire was more than \$7,300.

Grinnell Automatic Sprinklers have operated successfully in over 21,000 fires and have kept the average loss to \$289.38 per fire.

Because of the reduction in fire danger, insurance companies reduce their rates from 40 to 90% when this system is installed.

We gladly submit estimates and proposals on cost of a sprinkler equipment upon request and without cost or obligation. Special co-operative service to architects and engineers.



THE GRINNELL SPRINKLER HEAD.

COMPLETE.

A—Yoke.
B—Body.
C—Diaphragm.
E—Glass Valve.

EXPLANATION:

CROSS SECTION.

F—Main Strut Piece.
G—Hook on Strut.
H—Key on Strut.
J—Deflector.

STEAM AND HOT WATER HEATING EQUIPMENT.

Over fifty years of actual experience in installing heating equipments has given us a practical knowledge of this work which we believe you will find of invaluable assistance.

Grinnell Steam and Hot Water Heating Systems have successfully demonstrated their superiority over other types through actual use in large community housing projects and factories.

While architects and engineers are thoroughly familiar with the several vital factors entering into the heating problem, many of them are finding our new booklet, "Five Factors in Heating Costs," of value in discussing the heating question with their clients. Copy of this booklet will be sent free on request.

POWER PIPING INSTALLATIONS.

Grinnell Company is especially well equipped to handle power, process and miscellaneous industrial piping of any kind. Work of this nature requires a proper engineering organization, special manufacturing facilities, an expert road force and a fund of practical experience. In the Grinnell organization you find this rare combination which allows us to offer a type of piping service which cannot be duplicated in Canada.

We are ready at all times to send competent engineers to make a study of conditions and offer plans for improvement in already existing equipments and to co-operate to an unusual degree with architects and engineers in working out details for new equipments.

CAST IRON FITTINGS.

The completion of our new million dollar foundry and machine shop at Toronto now allows us for the first time to offer the Canadian trade an unlimited supply of standard and flanged "Grinnell" Fittings. This large addition to our facilities was made necessary by a rapidly increasing demand for these fittings from those who have found from experience that "'G' Fittings Mean Better Jobs With Less Labor."

These fittings were especially developed to meet our own large contracting needs in sprinkler, heating and general piping work and are, we believe, the highest quality product on the market. They are eminently worth specifying.



REDUCING ON OUTLET TEE.



REDUCING ON RUN TEE



TEE



CROSS

GRINNELL ADJUSTABLE PIPE HANGERS.

Our complete line of adjustable hangers, like our fittings, grew out of our own contracting needs. Straight pipe lines that can indefinitely be kept straight by the simple turn of a nut are made possible by these hangers. They have saved us untold trouble in our pipe work. We know they will do the same for others. The line is complete—an adjustable hanger for every purpose—including pipe coils and radiators.



The illustration at the left is a typical example of Grinnell Adjustable Pipe Hangers. Drawings at the right show how adjustments are easily and quickly made.

Figure 1 is a dimensional drawing of the Grinnell Adjustable Pipe Ring. The principal advantage of this type of ring is that it provides for easy and quick adjustment after pipe is erected. The ring is made in two parts,—the ring itself and an adjusting nut which is machine threaded to take a hanger rod. This nut provides for an adjustment of approximately one-half inch up or down by simply turning the nut to the left or right, without lifting or in any way disturbing the pipe, as is necessary with other makes of hangers.

Figure 2 is a dimensional drawing of the Grinnell Adjustable Swinging Type of hanger ceiling flange. This, with hanger rod, is used in conjunction with Adjustable Pipe Ring for hanging pipe from pitched roofs where adjustment is necessary. It is also useful in hanging overhead coils from roofs of the same type.

It is possible to obtain approximately the same amount of adjustment with the hanger flange as with the adjustable pipe ring.

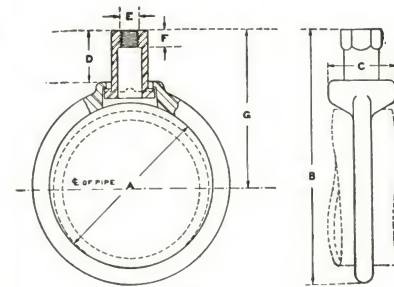


FIG. 1.

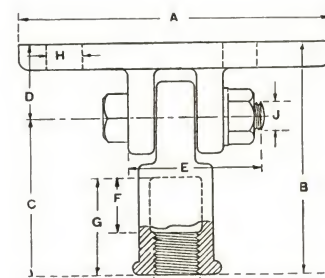


FIG. 2.

Send for our hanger booklet. By picture and dimensional drawings it describes the complete Grinnell Adjustable Hanger line.

WELDING AND PIPE FABRI- CATING.

Grinnell Company is splendidly equipped to make welded headers, pipe bends or cut and thread pipe to sketch. In addition to such work in our own plants, we can do welding on the job—our facilities including skilled men and the proper portable machinery for this important field work.

In fact, when you have piping work of any kind, you will find the Grinnell Company a service organization of long experience and exceptional facilities in everything that has to do with industrial piping.

GATES ENGINEERING COMPANY, LIMITED

314 NOTRE DAME ST. WEST PHONE MAIN 662
MONTREAL, QUE.

PRODUCTS.

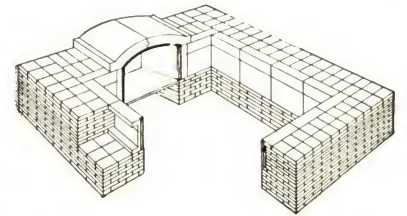
We specialize in BOILER SETTINGS and FURNACE BRICK WORK and give the benefit of (30) thirty years' experience. Ready to go anywhere to build new Boiler Settings and overhaul and reset old Boilers and build Furnaces.

FURNACE LININGS.

GATES ENGINEERING CO.'s FURNACE LININGS are known and used all through Canada for BOILER SETTINGS and FURNACE BUILDING, OVEN WORK and Power Plant brick work. The material used in our blocks is a special grade fire clay, more durable and possesses higher heat-resisting properties than ordinary fire brick and will not fuse until 3200 F. is reached. Crushing strength 2000 pounds per square inch.

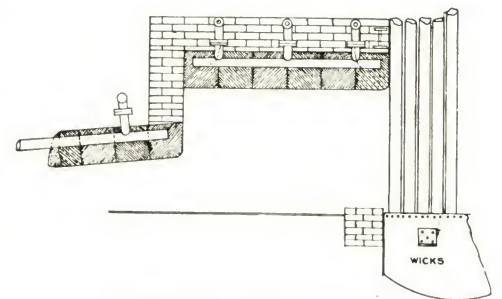
WATER AND AIR COOLED SUSPENSION ARCH.

THE GATES ENGINEERING CO.'s SUSPENDED FLAT ARCH is constructed of the required number of special shaped blocks to suit requirements and hung from extra heavy 3" longitudinal pipes which are supported from transverse circulating pipes and strong backs, which allows for all expansion and contraction which takes place in furnaces from extreme heating to cooling effects, and eliminates expansion strains, cracking and spalling of bricks, which is caused by pressure of adjoining bricks in furnace structure of other types of arches. The water passing through harness can be used for feed and other commercial purposes.



Each brick in the arch is supported independently of the other, allowing any one brick to be removed and replaced without disturbing any other portion of arch, which is money-saved, as most arches have to be renewed instead of being repaired, which is a big loss in material as well as production.

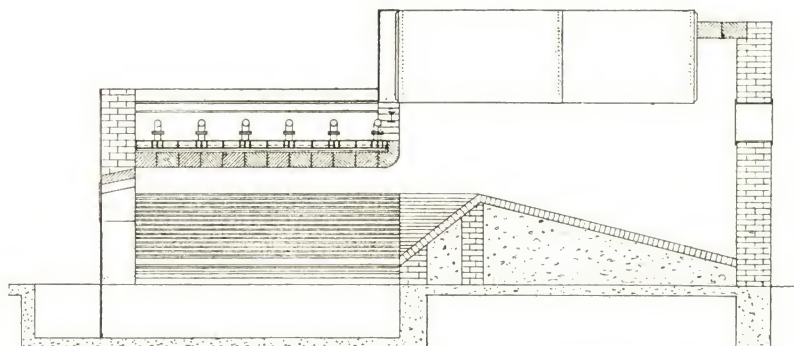
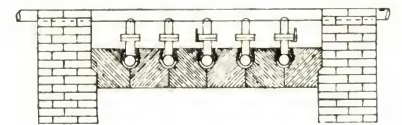
By referring to the cut it will be seen that by simply cutting out or lifting the retaining wedge, the defective brick can be dropped down from the roof of the arch and replaced without disturbing any other portion of the arch roof, and if necessary can be done without drawing fires.



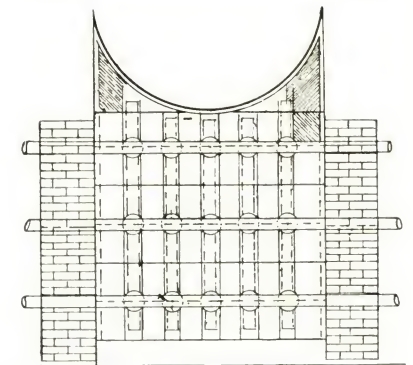
Patt. in U.S. and Canada, 1922

The brick or blocks are manufactured from the best refractories obtainable, are true to form, and will withstand high temperatures. The superstructure is of extra heavy 3" pipe and will not warp or twist out of shape.

THE GATES ENGINEERING COMPANY ARCH is not an EXPERIMENT. The illustration or cut shows the arch with ignition arch combined for stoker purposes or Dutch oven settings, and can be used in any form of furnaces.



DUTCH OVEN ARCH SETTING FOR BURNING TAN BARK AND HOG FUEL



Patt. in U.S. and Canada, 1922

INFORMATION.

We will furnish any other information asked for, and our Engineering Department will be pleased to co-operate with our clients in working out any problems which they may have pertaining to our line of work.

THE SMART-TURNER MACHINE CO., LIMITED

191 BARTON ST. E., HAMILTON, CANADA.

PRODUCTS:

AIR PUMPS.
AIR COMPRESSORS.
AUTOMATIC FEED PUMPS
BOILER FEED PUMPS.
(Duplex and Simplex—
Horizontal and Vertical).
HYDRAULIC PRESSURE
PUMPS.
CENTRIFUGAL PUMPS.
(Horizontal and Vertical).
FIRE PUMPS.
VACUUM PUMPS.
STEEL BARRELS.

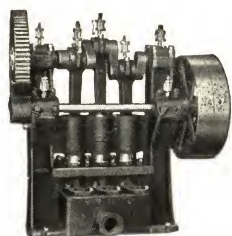


FIG. E-182

FIG. E-182 above shows Vertical Single Acting Triplex Power Pump for Boiler Feed and General Service. Write for sizes not mentioned in table below.

Diameter of Plungers	Stroke	Capacity per Revolution	Capacity in Gallons 30 to 60 R. P. M.	Suction Pipe.	Discharge Pipe.
2	3	.12	3.6 to 7.2	1 1/4	1 1/4
3	4	.33	10 to 20	1 1/2	1 1/2
4	5	.62	18.5 to 37	2	2
5	6	1.1	24.5 to 49	2 1/2	2 1/2
6	7	1.5	45 to 91	3	3
8	9	2.5	66 to 132	4	4
10	11	3.5	119 to 239	5	5
12	12	5.0	156 to 313	6	6



FIG. 134.

FIG. 134 above shows Simplex Vacuum Pump for Heating Systems, Condensers, etc. We make these Pumps both Steam and Power Driven.

Write for sizes not mentioned in the table below.

Dia. of Steam Cylinder.	Dia. of Pump Cylinder.	Length of Stroke.	Displacement in Gallons per Stroke.	Proper Strokes Per Minute.	Square Feet of Radiating Surface Pump will drain	Size of Pipes in Inches for Short Lengths.			
						Steam Pipe.	Exhaust Pipe.	Suction Pipe.	Discharge Pipe.
4	4 1/2	6	41	50	5100	1 1/2	3 3/4	3	2 1/2
5	6	7	73	50	9000	2	4 1/2	3 1/2	3 1/2
6	7	7	117	50	15000	2 1/2	5 1/2	4	4
8	9	7	152	50	19000	3	6 1/2	4 1/2	4 1/2
10	10	10	275	42	24000	4	8 1/2	5 1/2	5 1/2
12	12	12	587	38	56000	5	10 1/2	6 1/2	6

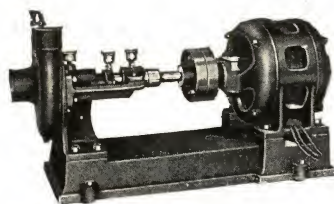


FIG. W-222.

No. of Pump.	Diameter Pipe		Rated Capacity, Gallons, per Minute.	H.P. per Ft. of Lift.	Maximum Head in Feet including Suction and Friction.	
	Suction.	Discharge.			1400 R.P.M.	1700 R.P.M.
1	1 1/2	1	15—25	.018—.025	25	40
1 1/4	1 1/2	1 1/4	30—40	.026—.034	45	70
1 1/2	2	1 1/2	50—70	.036—.05	70	100
2	2 1/2	2	100—120	.07—.08	70	100
2 1/4	3	2 1/4	150—180	.11—.13	80	125
2 1/2	3 1/2	2 1/2	200—260	.12—.15	100	150
3	4	3	300—470	.17—.27	125	150
3 1/4	5	3 1/4	500—735	.31—.45	125	150
3 1/2	6	3 1/2	800—1050	.41—.60	125	150
4	8	4	1000—2000	.56—1.12	125	150
10	12	10	2000—3000	1.12—1.68	125	150

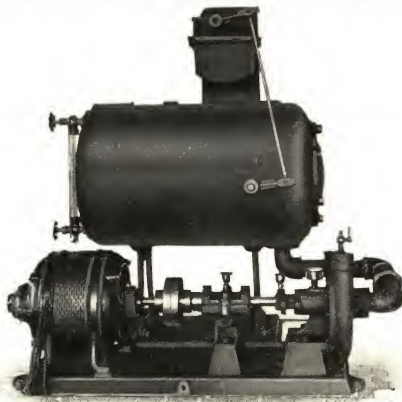


FIG. W-155.

FIG. W-155 shows our Motor Driven Automatic Feed Pump and Receiver.

Size	No. of Pump.	Pounds Delivered, per Hour.	Sq. Ft. of Radiating Surface Pump will Drain.	H.P. of Motor.	Max. Pressure obtainable with Single Stage Pump with Motor Run.		Height to Top of Receiver.	Floor Space.	Inlet to Receiver.	Discharge from Pump.
					1400 R.P.M.	1700 R.P.M.				
P.B.B.	1	7500	15000	1	8 lbs.	10 lbs.	27"	28 x 34	3"	1"
P.C.C.	1 1/4	12500	25000	1	12 lbs.	14 lbs.	32"	28 x 34	3"	1 1/4"
P.D.	1 1/2	25000	50000	2	13 lbs.	15 lbs.	33"	34 x 48	4"	1 1/2"
P.E.	2	40000	80000	3	13 lbs.	15 lbs.	33"	34 x 48	5"	2 1/2"

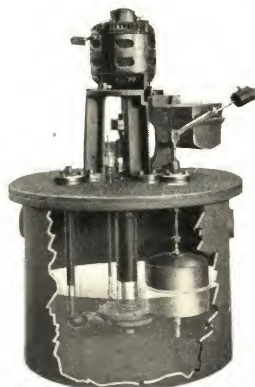


FIG. W-202.

FIG. W-202 shows a Vertical Sump Pump for Sewage or Sump work. Write for sizes not mentioned in the table below.

No. of Pump.	Suction Pipe.	Discharge Pipe.	Rated Capacity Gallons Per Minute	H.P. Per Foot of Lift	Maximum Head in Feet including Suction and Friction		Stand-ard Dia. of Sump. Cover.	Stand-ard Depth of Sump.
					1400 R.P.M.	1700 R.P.M.		
1 1/4	1 1/2	1 1/4	30—40	.026—.034	40 ft.	60 ft.	36 ins.	5 ft.
1 1/2	2	1 1/2	50—70	.036—.05	70 ft.	100 ft.	36 ins.	5 ft.
2	2 1/2	2	100—120	.07—.08	70 ft.	100 ft.	36 ins.	5 ft.
2 1/4	3	2 1/4	150—180	.11—.13	80 ft.	125 ft.	36 ins.	5 ft.
3	4	3	200—260	.12—.15	100 ft.	150 ft.	42 ins.	5 ft.

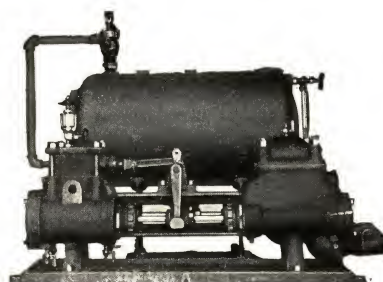


FIG. 153.

FIG. 153 above shows our Steam Driven Automatic Feed Pump and Receiver for returning condensation from Heating Systems to the Boiler. We make the Equipment with Motor Driven Pump. Write for sizes not mentioned in the table below.

Size.	Dia. of Steam Cylinder.	Dia. of Water Cylinder.	Length of Stroke.	Pounds Delivered per Hour.	Square feet of Radiating Surface it will Drain.	Floor Space	Height to Top of Receiver.	Steam.	Exhaust.	Inlet to Receiver.	Discharge from Pump.
B	4 1/2	2 3/4	4	5000	10000	27x41	26	1/2	3/4	3	1 1/2
CC	5 1/2	3 1/2	5	12000	24000	30x50	27	3/4	1 1/4	3	2 1/2
DD	6	4	6	24600	49200	32x52	33	1	1 1/2	4	3 1/2
KK	7 1/2	5	6	30000	60000	44x58	44	1 1/2	2	5	3
E2	7 1/2	5	10	46500	93000	47x72	44	1 1/2	2	5	3

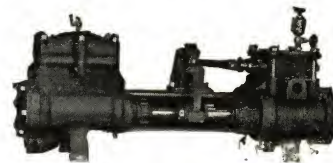


FIG. 164.

FIG. 164 shows our Duplex Packed Piston Pump. For Boiler Feed, General Service, Booster, etc. Write for sizes not mentioned in table below.

Size	No. of Pump.	Pounds Delivered, per Hour.	Sq. Ft. of Radiating Surface Pump will Drain.	H.P. of Motor.	Max. Pressure obtainable with Single Stage Pump with Motor Run.	Height to Top of Receiver.	Floor Space.	Inlet to Receiver.	Discharge from Pump.	Dia. of Steam Cylinder.	Diam. of Water Cylinder.	Length of Stroke.	Proper Strokes per Minute of One Plunger	Gallons Delivered per Minute by Both Plungers	Boiler Horse Power Pump will Feed.	Size of Pipes in Inches for Short Length			
																Steam Pipe	Exst. Pipe.	Su. n. Pipe	Dis'ge Pipe
P.B.B.	1	7500	15000	1	8 lbs.	10 lbs.	27"	28 x 34	3"	4 1/2	2 3/4	4	60 to 120	12 to 24	100	1 1/2	3/4	2	1 1/2
P.C.C.	1 1/4	12500	25000	1	12 lbs.	14 lbs.	32"	28 x 34	3"	5 1/2	3 1/2	5	60 to 120	25 to 50	200	2	1 1/4	2 1/2	2 1/2
P.D.	1 1/2	25000	50000	2	13 lbs.	15 lbs.	33"	34 x 48	4"	6	4	6	60 to 120	39 to 78	300	1	1 1/2	4	3 1/2
P.E.	2	40000	80000	3	13 lbs.	15 lbs.	33"	34 x 48	5"	7 1/2	5	6	55 to 110	56 to 112	500	1 1/2	2	5	3
										7 1/2	5	10	40 to 80	68 to 136	800	1 1/2	2	4	3

HALIFAX OFFICE:
3 Simson Bldg.
J. A. THOMPSON, Manager.

OTTAWA OFFICE:
71½ Sparks Street.
CHARLES V. CLARK, Manager.

TORONTO OFFICE:
77 York Street.
H. J. CHURCH, Manager.

DARLING BROTHERS LIMITED

ENGINEERS,
MANUFACTURERS AND FOUNDERS.

HEAD OFFICE AND WORKS:

120 PRINCE STREET, MONTREAL, P.Q.

QUEBEC OFFICE: 203 St. John Street. W. J. BANKS, Agent.

WINNIPEG OFFICE:
104 Princess Street.
CHARLES A. SARGENT, Manager.

CALGARY OFFICE:
605 Second Street West.
S. S. CLARKE, Agent.

VANCOUVER OFFICE:
1144 Homer Street.
FRANK DARLING & Co. LTD., Agents

WE ARE SOLE AGENTS AND MANUFACTURERS FOR CANADA FOR THE WEBSTER SYSTEM OF STEAM HEATING, BOTH VACUUM AND MODULATION SYSTEMS
WE ALSO MANUFACTURE "PUMPS FOR ANY SERVICE" AND A FULL LINE OF "STEAM APPLIANCES".

OUR PRODUCT.

HEATING APPLIANCES
AIR WASHERS
STEAM PUMPS
AIR COMPRESSORS
POWER PUMPS
ELECTRIC PUMPS
CENTRIFUGAL PUMPS
BILGE PUMPS
SEWAGE EJECTORS
FEED WATER HEATERS
GRADUATED VALVES
OIL FILTERS
DUMB WAITERS

HOT WATER HEATERS
HOT WATER GENERATORS
FEED WATER FILTERS
RECEIVING TANKS
PRESSURE REDUCING VALVES
BACK PRESSURE VALVES
OIL EXTRACTORS
STEAM SEPARATORS
GREASE TRAPS
STEAM TRAPS
PRESSURE GAUGES
STAIR TREADS
WATER COLUMNS

EXHAUST HEADS
BLOW-OFF TANKS
BOILER FEED REGULATORS
TANK FLOAT VALVES
PIPE BENDS
EXPANSION JOINTS
PUMP GOVERNORS
DIRT STRAINERS
AIR TRAPS
AIR LINE VALVES
LUBRICATORS
VALVE RESEATING MACHINES
FREIGHT ELEVATORS, PASSENGER ELEVATORS

DARLING SERVICE

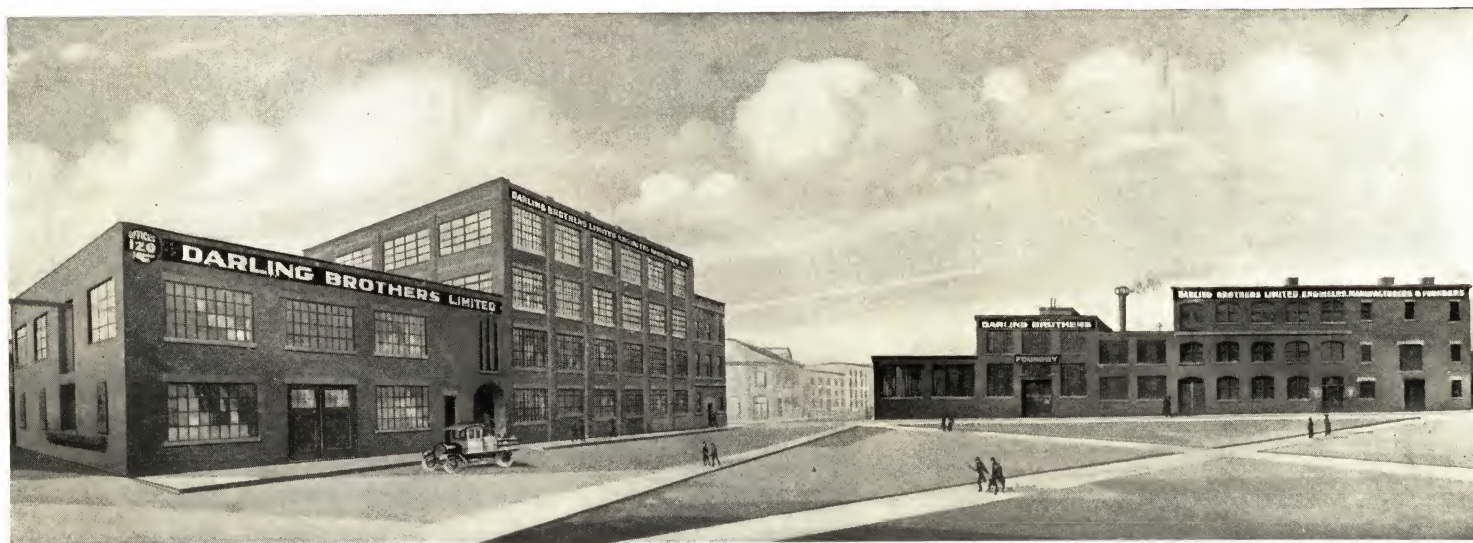
We make preliminary investigations and give advice as to choice and application of any of our Steam Appliances for new or old plants at no expense or obligation.

We maintain eight branch offices and service stations covering all parts of Canada in charge of competent engineers who are prepared to co-operate to the fullest extent with Architects, Engineers Contractors and Owners.

Over Fifteen Thousand Webster Steam Heating Systems, Six Thousand Webster Heaters, and an ever-increasing number of other Darling Steam Appliances have gone into service during the past thirty-four years.

Some Darling appliances can be used in every plant, the Darling engineering experience determining in each case what should and what should not be used.

See also our advertisement on Elevators page 111, and Mason Stair Treads page 123, and Whitlock-Darling Heaters on opposite page.



OUR PLANT.

The above is a bird's eye view of Darling Brothers Works and Offices, corner of Ottawa and Prince Streets, Montreal.

We cordially extend an invitation to all Architects, Engineers, Contractors, Owners and other friends to visit our plant at any time, where they may see the sterling quality and workmanship that is put into our product. Often a visit of this kind proves not only interesting, but instructive and enjoyable to both our friends and ourselves.

HALIFAX OFFICE:
3, Simpson Bldg.
J. A. THOMPSON, Manager.

OTTAWA OFFICE:
71½ Sparks Street.
CHARLES V. CLARK, Manager.

TORONTO OFFICE:
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H. J. CHURCH, Manager.

DARLING BROTHERS LIMITED

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CALGARY OFFICE:
605 Second Street West.
S. S. CLARKE, Agent.

VANCOUVER OFFICE:
1144 Homer Street.
FRANK DARLING & Co. LTD., Agents

WHITLOCK-DARLING HEATERS

MADE-IN-CANADA

FOREWORD

This limited space will not allow detailed descriptive matter regarding the design and workmanship of the product as manufactured by this Company. Neither will the space permit of detailed analysis of the various heaters under varying conditions. Bulletins describing in detail any of the heaters shown will be gladly sent to parties interested.

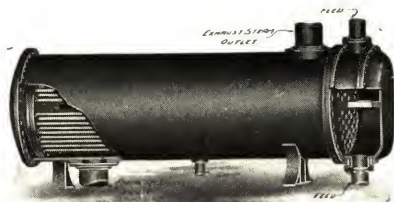


FIG. 152. TYPE "S" WHITLOCK DARLING STRAIGHT TUBE FLOATING HEAD HEATER



FIG. 151. TYPE "R" WHITLOCK DARLING HEATER

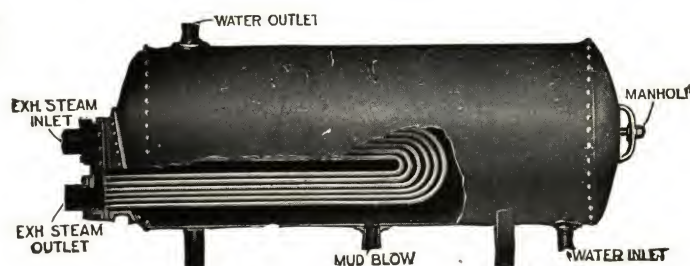


FIG. 14. TYPE "K" WHITLOCK DARLING SERVICE HEATER

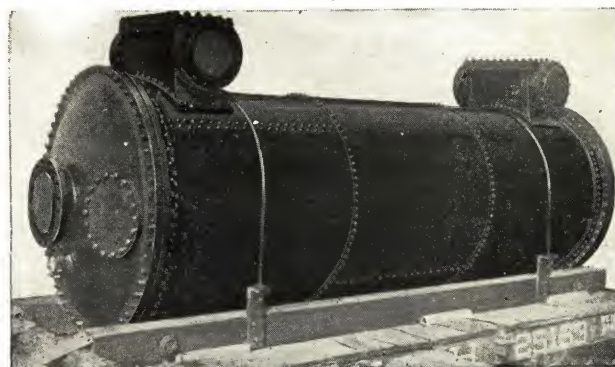


FIG. 204. TYPE "B" WHITLOCK DARLING STANDARD FEED WATER HEATER. HORIZONTAL PATTERN

TYPES OF HEATERS.

Closed feed water heaters, storage heaters, instantaneous heaters, hot water converters, swimming pool heaters, sprinkler tank heaters, drip coolers, oil heaters and coolers, condensers, etc. These heaters are made either of the coil type, straight tube or U-bend to meet the conditions existing.

USES.

Hot water for hotels, apartment houses, schools, Y.M.C.A.'s, public buildings, mills, and other industrial plants, etc.

FUEL OIL HEATERS.

Oil coolers, anti-freezing sprinkler tank heaters, heaters for swimming pools, hot water converters for gravity or forced circulation, hot water heating jobs.

BULLETINS.

Bulletins are issued for each particular type of heater, describing in detail the proper uses and connections.



FIG. 15A. TYPE "AC" WHITLOCK DARLING COPPER COIL HEATER

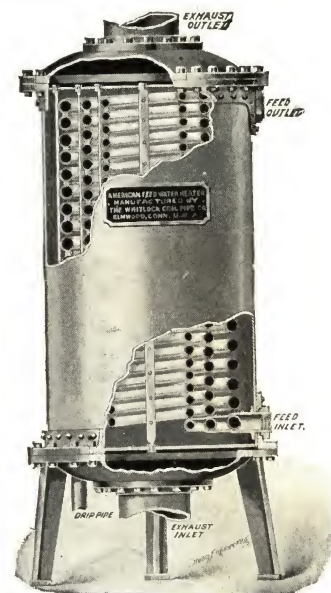


FIG. 18. TYPE "A" WHITLOCK DARLING STANDARD FEED WATER HEATER

See also our advertisements on Mason Treads, page 123, Elevators, page 111, and also opposite page.

THE ARTHUR S. LEITCH CO. LIMITED

1001 AND 1002 KENT BUILDING, TORONTO.

REPRESENTING:

TAYLOR STOKER CO. OF CANADA, TORONTO—TAYLOR STOKERS.
NASH ENGINEERING CO., SOUTH NORWALK, CONN.—RETURN LINE HEAT
ING PUMP AND AIR COMPRESSOR.
SIMS CO., ERIE, PA.—HEATERS.
RUMSEY PUMP CO., SENECA FALLS, N.Y.—ROTARY AND TRIPLEX PUMPS.
CANADIAN KELLOGG CO., LTD., NEW YORK—RADIAL BRICK CHIMNEYS.
COFFIN VALVE CO., NEPONSET, MASS.—SLUICE GATES AND GATE VALVES.
ARMSTRONG MACHINE WORKS, THREE RIVERS, MICH.

DEAN BROS., INDIANAPOLIS, IND.—STEAM PUMPS.
COPPUS ENGINEERING & EQUIPMENT CO.—BLOWERS AND B. F. PUMPS.
NORWALK IRON WORKS, SOUTH NORWALK, CONN.—AIR COMPRESSORS.
ROBERTS FILTER MFG. CO., DARBY PA.—FILTERS AND WATER SOFTENERS.
KEILEY-MUELLER, INC., NEW YORK CITY—STEAM SPECIALTIES.
BINKS SPRAY EQUIPMENT CO., CHICAGO—SPRAY PONDS.
BEAUMONT MANUFACTURING CO., PHILADELPHIA—ASH AND COAL GATES.
JOS. W. HAYS CORP., MICHIGAN CITY, IND.—COMBUSTION INSTRUMENTS.

JENNINGS TURBINE PUMPS.

Jennings Return Line Vacuum and Low Pressure Boiler Feed Pumps for return line Heating Systems, Dryer Exhaust Systems in Paper Mills or other Vacuum work where large percentages of liquids have to be handled with gas.

The pump consists of two independent turbine units, an air pump and a water pump combined in one casing, with one impeller of each mounted on the same shaft.

One unit continuously exhausts air and vapours from the heating system, and the other removes the condensation as it accumulates and forces it directly into the boiler or up to the hot-well.

The boiler pressure is against the water only. The air and vapour, representing approximately four-fifths of the volume handled, are delivered to the atmosphere without back pressure. The saving in horse power amounts to over 50%.

THE AIR PUMP.

The air unit of the Jennings Pump is our well-known Nash Hytor Turbine, a rotor in hydraulic balance, revolves freely, with large clearances, in an elliptical casing filled with water. The water turning with the rotor but following the casing due to centrifugal force, alternately recedes from and is forced back into the rotor. The water, acting as a piston, continuously draws the air in through the inlet ports, compresses the air and discharges it through the outlet ports.

THE WATER PUMP.

The water end of the pump is a centrifugal pump with enclosed impeller, specially designed to give very high efficiency and to unload when not handling water.

OPERATION.

Referring to Fig. 1, the heating returns, air and water pass through the Self-cleaning Strainer (14) into the Separating Tank (15). The water falls to the bottom of the Tank (15) and passes into the centrifugal through the pipe (1) driving out the air through the pipe (5). As soon as the centrifugal is full of water it begins to pump and forces the condensation into the boiler through the pipe (2), emptying the tank (15). The centrifugal now stops pumping because it cannot handle air, the check valve (7) preventing a back flow. The power required to drive the centrifugal is closely proportional to the quantity of water handled. It takes no power when it is not pumping.

The air is rapidly exhausted from the system by the air unit, which is connected to the top of the tank (15) by the pipe (3).

DAYTON-DOWD CENTRIFUGAL PUMPS.

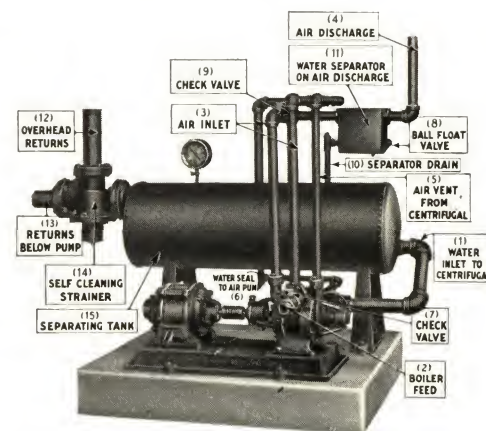
TYPE CS SINGLE STAGE: are of the non-overloading type, and so designed that the power consumed under any condition of variation of head will not exceed the power required under normal operation. This feature protects the motor from being seriously overloaded.

TYPE CS PUMPS of the single stage construction are furnished with impellers of the enclosed double suction type.

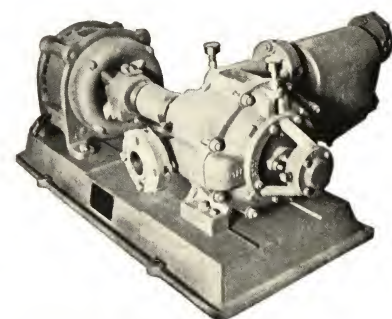
TYPE CSU MULTI-STAGE: For service where the total head is beyond the range of efficient application of our type CS single-stage pumps, the type CSU automatically balanced multi-stage pump is specified, the number of stages being dependent on the head and the speed available to drive the pump. Where the head is greater than can be generated by a four-stage pump it is advisable to install two multi-stage pumps connected in series, in order to avoid the troubles incident to the construction and operation of pumps having a greater number of stages. There is, of course, no theoretical limit to the number of stages in a centrifugal pump, but practical problems of manufacture and operation are interposed, which make it unwise to build pumps above four stages on account of the excessive distance between bearing centres and the correspondingly heavier impeller blades on the shaft. The compact design of CSU pumps, discharge and suction openings being on the same side of the case, permit operations in series with the greatest ease, the piping being in direct line.

NOTE.

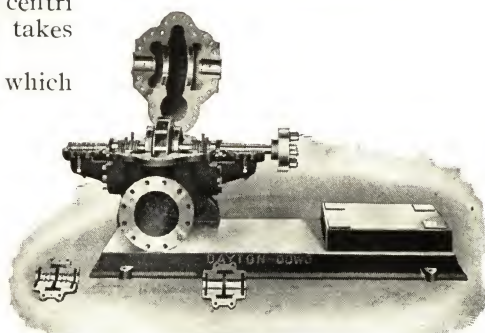
All parts are easily accessible due to horizontal split casing, It is not necessary to break any water con-



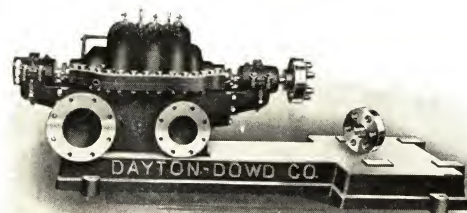
JENNINGS RETURN LINE VACUUM AND LOW PRESSURE BOILER FEED PUMP



NASH HYTOR COMPRESSOR WITH DIRECT CONNECTED MOTOR.



TYPE CS SINGLE STAGE DOUBLE-SUCTION CENTRIFUGAL PUMP WITH UPPER HALF OF CASING RAISED. NOTE EASY ACCESS TO ALL WORKING PARTS.



TYPE CSU AUTOMATICALLY BALANCED THREE-STAGE CENTRIFUGAL PUMP WITH EXTENDED BEDPLATE FOR DIRECT CONNECTION TO MOTIVE POWER.

COPPUS TURBO BLOWER.

For Undergrate Draft and other Industrial uses. The Coppus consists of a propeller fan driven by a steam turbine, both mounted on the same shaft.

From the steam chamber, which is located at the top of the turbine, the steam enters the nozzles at high pressure and is expanded in the nozzles, where its pressure is changed into velocity energy. Now at low pressure, but flowing at high velocity, the steam is delivered by the nozzles to the point of impact, on the buckets of the turbine wheel, which revolves within the casing.

The fan located at the opposite end of the shaft carrying the turbine wheel draws the air in around the turbine and forces it through the fan casing.

The exhaust steam may be piped off for further use or may be discharged through the fan casing with the air.

ADVANTAGES.

Among the many advantages derived from the use of the Coppus Turbo Blower are:—

(1) Cheap fuel may be used. (2) Perfect combustion. (3) Excess air cut down. (4) Constant furnace temperature. (5) Eliminates smoke.

The Coppus has been used with the best results for ventilating dye houses, laundries, kitchens, rendering plants, etc.

COPPUS VANO BLOWER.

Steam Turbine, Air Turbine, Electric Motor or Belt Driven for pressures up to 6".

COPPUS STEAM TURBINES.

Turbines are now being manufactured up to 50 H.P.

COFFIN SLUICE GATES AND GATE VALVES.

COFFIN SLUICE GATES (Rectangular and Circular in form, operated by Electric and Hand Power.)
GATE VALVES AND GATE HOISTS.
BALL-BEARING STANDS (For operating large Sluice and Gate Valves.)

BUTTERFLY VALVES (For installation where rapidity of operation and compactness are desired).

CHECK, FLAP AND FOOT VALVES.

FLUSHING, SEWER AND SLIDE SEWER GATES.

COFFIN VALVES FOR SEWERAGE.

AUTOMATIC SEWAGE FLOW REGULATORS.

HYDRANTS AND OTHER DEVICES FOR THE CONTROL OF WATER.

Coffin Equipment was used throughout on the City of Peterboro Filtration Plant.

COFFIN NEEDLE VALVES.

The Coffin Balanced Needle Valve is used in place of slide gates for controlling the amount of water discharged from a dam. Being in Hydraulic balance, the water which it controls is used to assist the mechanism in opening and closing the valve against high heads. At all times the valve's position is controlled by the mechanism from a distant control chamber.

THE TAYLOR STOKER.

The Taylor Stoker is a combustion system which burns all grades of bituminous coal efficiently. Even with low grades of bituminous coal—which many furnaces cannot burn at all—the Taylor Stoker will operate boilers at immense over-ratings and will carry widely fluctuating loads with high efficiency.

The Taylor Stoker does this because the coal is fed and burned on scientific principles, mechanically applied. In short, Taylor Stokers solve the coal problem in the power plant. Where a plant uses high or low grade coal the Taylor Stoker permanently reduces steam production costs by this ability to operate boilers for above rated capacity, not only at peaks but on steady loads.

THE TAYLOR IS MORE THAN A STOKER—IT IS A COMPLETE SYSTEM OF COMBUSTION.

ADVANTAGES.

(1) It increases capacity—Investing in one set of Taylor Stokers is equivalent to enlarging entire plant 50 to 100 per cent.

(2) It produces economy—It develops over-all efficiency up to 80 per cent.

(3) It develops flexibility—Very satisfactory under quick and extreme changes of load.

(4) Smokeless.

(5) It burns anything combustible.

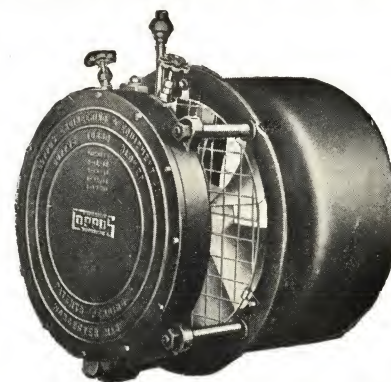
(6) It cuts repair costs—The Taylor Stoker is conceded to have the lowest repair cost per ton of coal fired of any stoker made.

(7) It requires minimum attention.

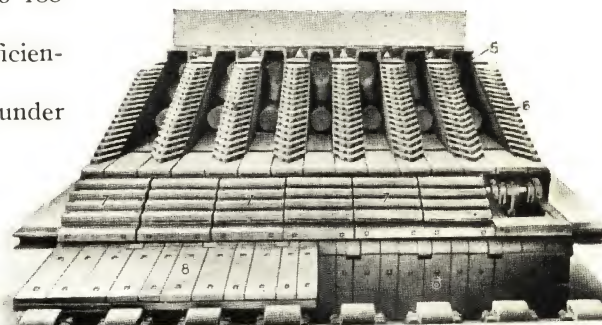
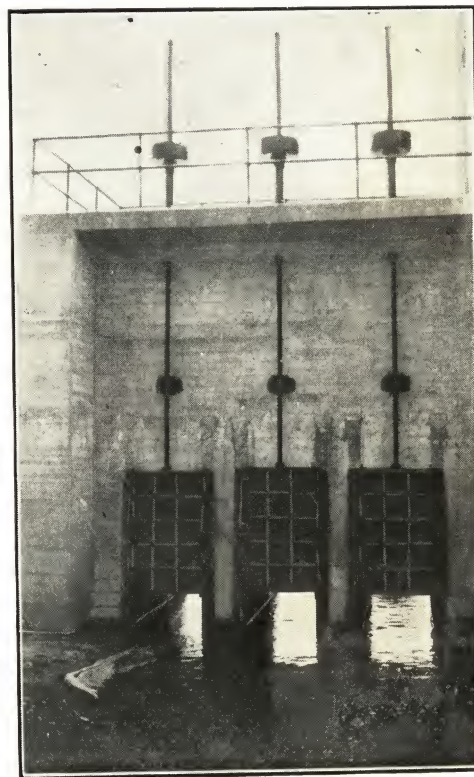
(8) It cleans itself mechanically.

KELLOGG CHIMNEYS

See Advertisement of Canadian Kellogg Co., Limited in this issue.



COPPUS TURBO BLOWER. TYPE. C.



TAYLOR STOKER, TYPE AA, WITH POWER DUMP.

5. 5 Feeding Rams.

6. Distributing Rams.

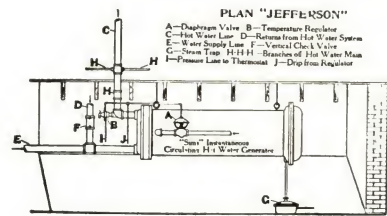
7. 7. Extension Grate Sections.

8. 8. Dump Plates.

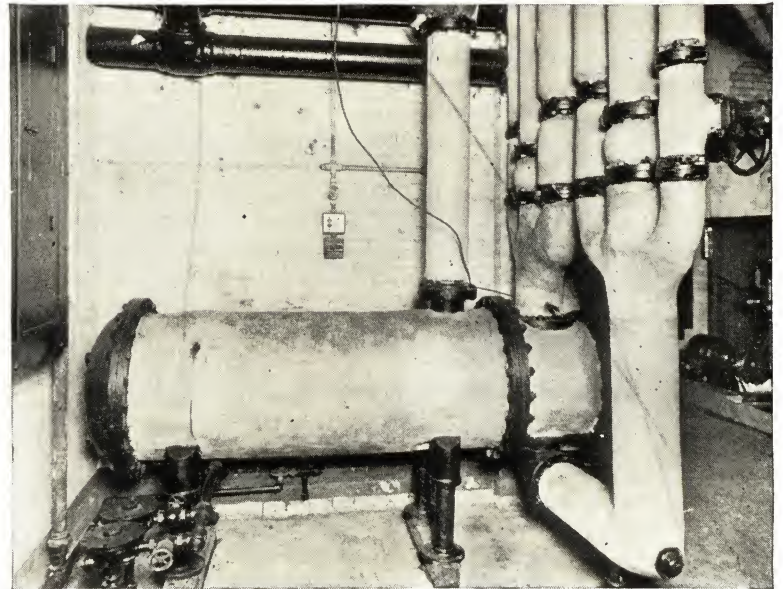
SIMS PRODUCTS

CLOSED FEED WATER HEATERS
OPEN FEED WATER HEATERS
CLEAN EZ STORAGE HEATERS

HOT WATER GENERATORS
HOT WATER CONVERTORS
OIL FILTERS & OIL SEPERATORS



SIMS CIRCULATING GENERATOR



SIMS CIRCULATING GENERATOR THE LATE SIR JOHN EATON'S RESIDENCE

THEIR USES

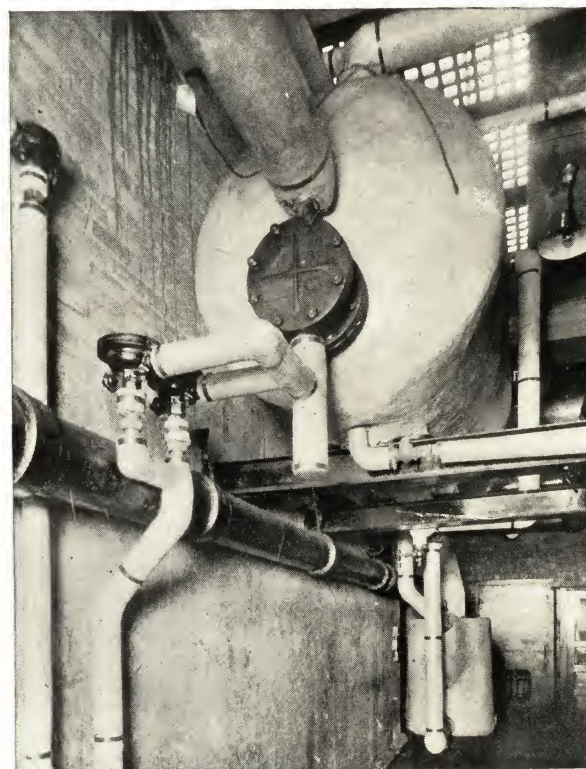
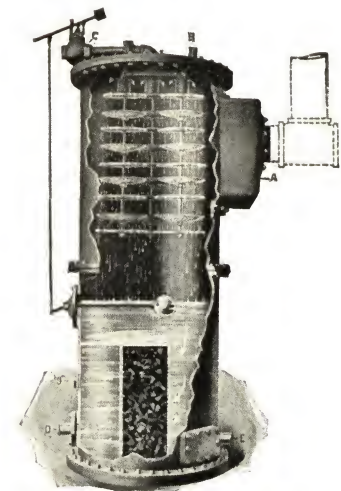
Closed Feed Water Heaters:
Heating feed water.

Open Feed Water Heaters:
Purifying and heating feed
water.

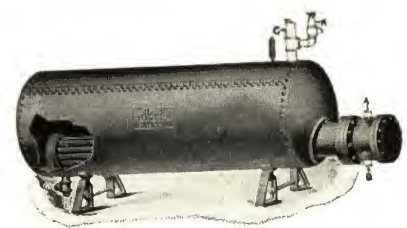
Clean EZ Storage Heaters:
Domestic purposes in hotels,
hospitals, laundries and all
large buildings.

Hot Water Generators:
Forced hot water circulation
or as instantaneous heaters.

Hot Water Convertors:
Gravity hot water circula-
tion.

SIMS CLEAN EZ STORAGE HEATER,
THE LATE SIR JOHN EATON'S RESIDENCE

SIMS OPEN FEED WATER HEATER

SIMS CLEAN EZ STORAGE HEATER
TYPE B.H.

YOUNG PUMP COMPANY OF CANADA.

HAMILTON, ONT.

MANUFACTURERS

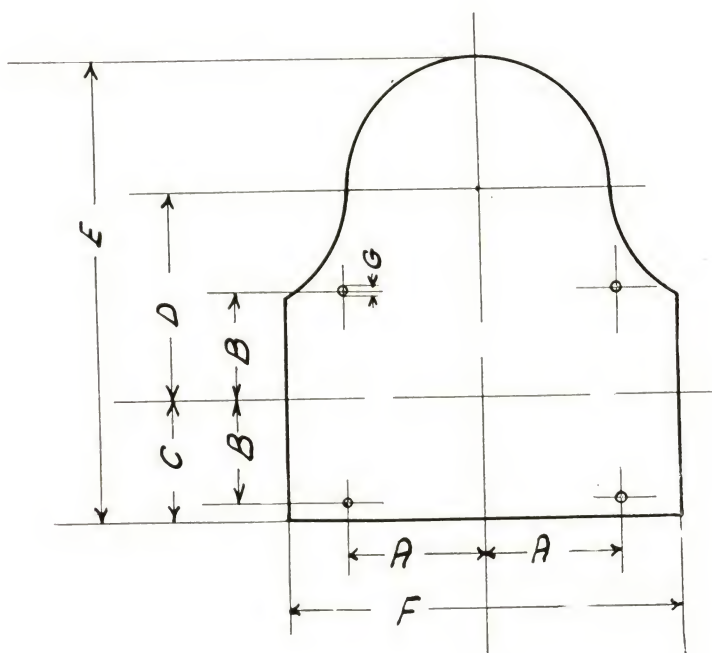
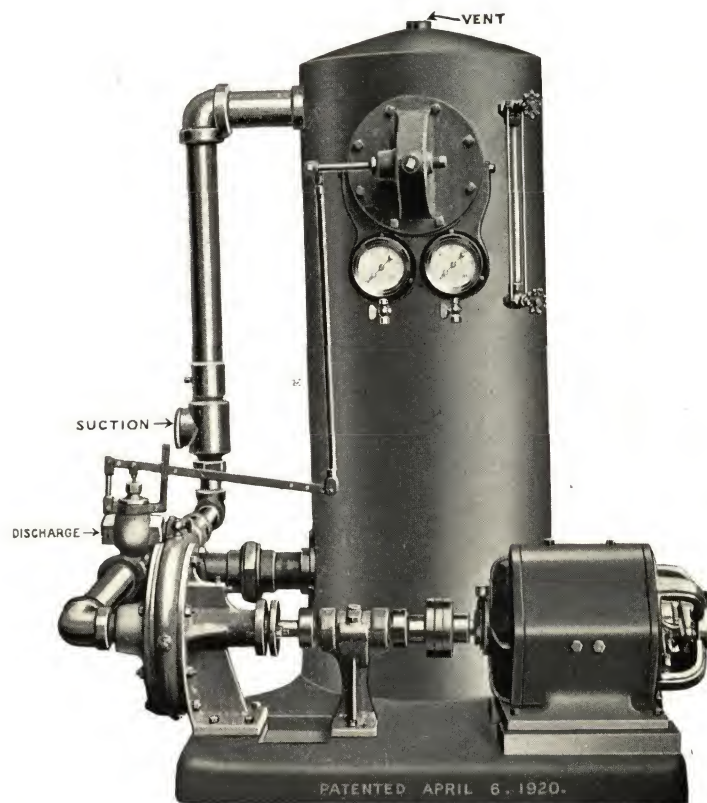
PRODUCT.

THE YOUNG CENTRIFUGAL VACUUM AND BOILER FEED OUTFIT¹ was primarily designed for removing all air and water of condensation from Steam Heating Systems, returning the water of condensation back to the boiler, and maintaining a vacuum on the system. It is also adapted for use in connection with DRY KILNS, PAPER DRIERS, FEED DRIERS, PRINT MILLS, COOKING APPARATUS, VACUUM PANS, etc.

The operation of the outfit is as follows: the centrifugal pump forces water through the YOUNG EXHAUSTER (marked suction), creating a vacuum; air and water are thus delivered into the tank; as the water accumulates, copper float in tank raises and opens the balance valve (marked discharge), allowing the pump to deliver the accumulated water into heater or other receptacle provided for the purpose.

Standard equipment is designed to deliver water against twenty pounds pressure at the pump. The maximum vacuum obtainable will range from 26" to 28". For automatic control, the vacuum regulator is set to cut in at 4" and cut out at 10".

When requesting information or prices, advise: square feet of heating surface or pounds of condensation per hour; discharge water pressure required at pump; nature of electric current, whether direct or alternating; if direct, give voltage; if alternating, give voltage, cycle, and phase; continuous or automatic operation.



OUTFITS ARE SHIPPED ASSEMBLED AS ILLUSTRATED. THEY ARE SIMPLE IN CONSTRUCTION, EFFICIENT IN OPERATION, PRACTICALLY NOISELESS, AND INEXPENSIVE TO INSTALL AND MAINTAIN

Size.	No. 1	No. 2	No. 3	No. 4	No. 5
Maximum capacity sq. ft. radiation	8000	16000	26000	40000	65000
Size Suction*	1 1/2"	1 1/2"	2"	2 1/2"	2 1/2"
Size Discharge*	1"	1 1/4"	1 1/4"	1 1/2"	2"
Base to Top of Tank	41 1/2"	41 1/2"	50 3/4"	55"	55"
Base to Centre of Suction	19 1/2"	19 1/2"	21"	22"	23"
Base to Centre of Discharge	14 9/16"	14 9/16"	18 1/8"	18 1/2"	19 13/16"
A	11 1/2"	11 1/2"	11 1/2"	14"	14"
B	8 3/4"	8 3/4"	10 1/4"	9 3/4"	9 3/4"
C	10 1/4"	10 1/4"	11 1/2"	12 1/4"	12 1/4"
D	17"	17"	18"	19"	19"
E	37"	37"	39 3/4"	52 1/4"	52 1/4"
F	33 1/4"	33 1/4"	34"	42"	42"
G	13/16"	13/16"	13/16"	13/16"	13/16"

*Increase size of piping installed between pump and boiler and header.



THE CANADIAN FAIRBANKS-MORSE CO., LIMITED

CANADA'S DEPARTMENTAL HOUSE FOR MECHANICAL GOODS.

HEAD OFFICE: MONTREAL.

ST. JOHN. QUEBEC. MONTREAL. OTTAWA. TORONTO. HAMILTON.
WINDSOR.



PRODUCTS.

STEAM ENGINES, BOILER FEED PUMPS, FEED WATER HEATERS, OIL SEPARATORS, TRAPS, VALVES, PACKINGS AND STEAM APPLIANCES AND FITTINGS OF ALL KINDS; LATHES, DRILLS AND METAL WORKING MACHINERY OF ALL KINDS; WOOD WORKING MACHINERY, INCLUDING BAND SAWS, LATHES, JOINTERS, ETC.; PIPE CUTTING MACHINERY, HOISTING MACHINERY, WEIGH SCALES, MOTOR SUPPLIES, SMALL TOOLS, ETC.

VALVES.

Fairbanks Valves are widely known and popular among engineers. They are simple in design, contain few parts, and all parts are interchangeable.

Special attention is called to the Fairbanks Renewable Disc, which is the most effective ever produced. It consists of a recessed brass disc into which is spun a specially prepared Bakelite ring. The Disc is held centrally on its seat by guides cast in the body of the valve, and is secured to the end of the spindle without the use of nuts, screws, pins, wires, or anything that is liable to become detached while in use. It is but the work of a minute and requires no skill to unscrew the valve bonnet, slip off the old disc from the end of the spindle, and substitute a new one in its place. They have a raised round seat upon which scale, grit or sediment is not likely to lodge.

These valves are heavily built and well proportioned. The stuffing boxes are packed with Palmetto Twist, which is self-lubricating and has great superiority over any other fibrous packing.

STEAM TRAP

The "Strong" Steam Trap combines with perfect mechanical construction several exclusive features. The shape of the bucket increases its effective weight and, therefore, the capacity of the trap above others of the same size. The top cap can be removed by unscrewing three bolts, thus uncovering the valve mechanism without disturbing the pipe connections. The valve seat and tip are made of special steam metal and are renewable. These valves are made in various sizes so that the same trap can be fitted for any pressure from 0 to 250 lbs.

STEAM PUMPS.

Fairbanks-Morse line of Steam Pumps includes a wide range of Boiler Feed Pumps, Low Steam Pressure Pumps, Underwriters' Fire Pumps, General Service Pumps, etc., etc. The accompanying cut shows the Fairbanks-Morse Duplex Ram Pattern Pump for discharge pressure not exceeding 175 pounds. In this type of pump the plungers are always in sight, and the stuffing box packing is easily adjusted or replaced, without breaking joints or removing cylinder heads. The element of slippage is reduced to a minimum and the volumetric efficiency increased. These pumps are adapted for handling water at a high temperature or water containing sand or grit. They also offer many advantages for high pressure boiler feed work.

BOILER FITTINGS.

Fairbanks-Morse line of Engine and Boiler Fittings is so extensive that it is impossible to attempt to give any description of same in anything but our regular catalogue.

DURABLA PACKING.

Durabla Gaskets will make a tight joint wherever a permanent Gasket is required. Good for Oil, Gas, Water or Steam. Will do the work of double its thickness of rubber.

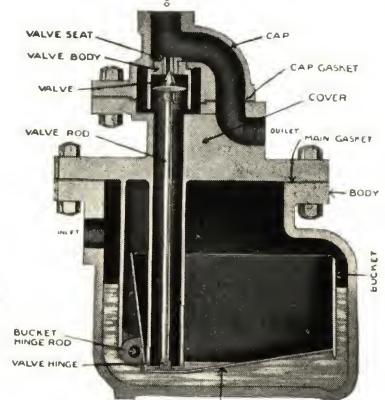
FOSTER VALVES.

Foster Reducing and Regulating Valves cover a wide range of requirements from Automatic Boiler Stop Valves, Oil Fuel Regulating Valves, Fan Engine and Pump Governors, down to the ordinary Reducing Valves for controlling the flow of steam. High-grade workmanship necessary for valves of this kind is always found in Foster Valves.

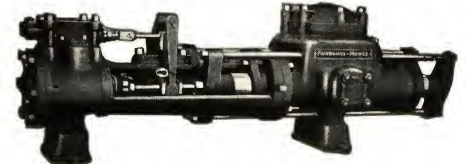
Send for complete Foster Valve Catalogue.



RENEWABLE DISC VALVE.



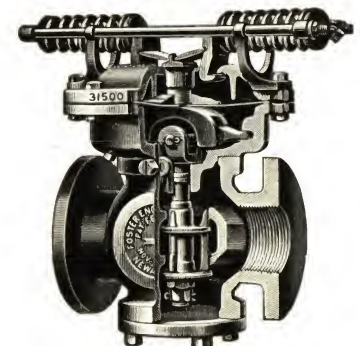
STRONG STEAM TRAP



DUPLEX RAM PATTERN PUMP.



DURABLA PACKING.



FOSTER CLASS W REDUCING VALVE.



THE CANADIAN FAIRBANKS-MORSE CO., LIMITED

CANADA'S DEPARTMENTAL HOUSE FOR MECHANICAL GOODS

HEAD OFFICE: MONTREAL.

WINNIPEG

REGINA.

SASKATOON.

CALGARY.

VANCOUVER.

VICTORIA.



PRODUCTS

ELECTRIC MOTORS OF ALL TYPES AND SIZES, MOTOR-GENERATORS, ENGINE-GENERATOR SETS, STORAGE BATTERIES, ELECTRIC AUTOMATIC WATER SUPPLY SYSTEMS, AUTOMATIC ELECTRIC LIGHTING PLANTS, ELECTRIC PORTABLE DRILLS, ELECTRIC BENCH DRILLS, SWITCHES, PRESSURE REGULATORS AND ELECTRICAL FITTINGS OF ALL KINDS. MOTOR-DRIVEN COMPRESSORS, CENTRIFUGAL PUMPS, ETC., ETC.

MOTORS.

Fairbanks-Morse Motors are made in all standard types and sizes. Lack of space prevents a detailed description being given, but the following are a few points of superiority:

1. All Fairbanks-Morse Motors can be supplied either with Ball Bearings or self-oiling sleeve bearings.
2. The bearing sleeves are Phos. Bronze, reamed to size, dust proof, interchangeable, and easily renewable.
3. The Stator Frame permits of perfect ventilation.
4. The End Rings are cast on to the ends of the Rotor Bars, thus forming a perfect electrical and mechanical joint and eliminating all trouble from nuts, washers, solder, etc. As the metal is fused to the bars at a temperature of over 1000 degrees Cent., it will be seen that danger from subsequent heating is entirely eliminated.

CENTRIFUGAL PUMPS

Fairbanks-Morse Centrifugal Pumps are designed to stand heavy service, and the line includes all standard types for Water Supply, Irrigation, Fire Underwriters and General Service for manufacturing plants. They can be used with any type of drive, and will give continuous and efficient service with a minimum of expense for attendance and repairs.

TRIPLEX POWER PUMPS.

The Goulds line of Triplex Power Pumps includes all types and sizes for every power-pumping service. Single units are regularly furnished with capacities as small as 2 gallons per minute and ranging from this up to 2,270 gallons per minute, or over three million gallons per day. Larger sizes can be supplied special to order.

In every country of the world, Goulds Triplex Pumps are widely used and recognized as the leaders in reliability and operating efficiency. Driven by electric motors, gas or oil engines, turbines or other modern drivers, these pumps will show savings of two-thirds and often more in pumping costs, over direct-acting steam pumps of the same capacities and pressures.

OIL ENGINES.

Fairbanks-Morse Type "Y" Semi-Deisel Engines are designed to operate on low grade oil. Some of the special features of this engine are:

Power at minimum cost; operation practically automatic; perfect lubrication; combustion chamber water jacketed; no hot ball to over-heat or burn out; air-tight crank case; special quick starting arrangement.

The "Y" Engine is made in both horizontal and vertical types and can be supplied in sizes from 10 to 300 H.P. in single units.

OPEN AND ENCLOSED TYPE STEAM ENGINES.

The "Allen" Engines are of the double-acting vertical type and are constructed either as "open" engines or as "totally enclosed" engines with forced lubrication.

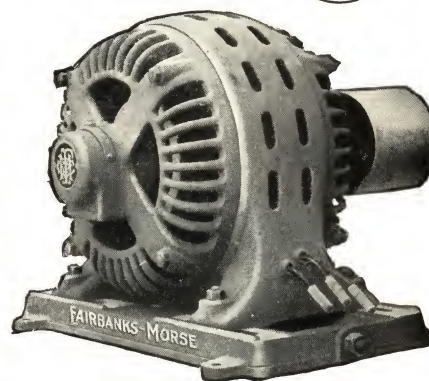
The engines are constructed in every case with substantial proportions and very large wearing surfaces for continuous running.

Their advantages comprise automatic lubrication, simplicity, silent running, minimum of attention, durability, accessibility, efficient governing, compactness, maintained efficiency, low cost, low running expense, low steam consumption suitability for superheated steam, and interchangeability of parts.

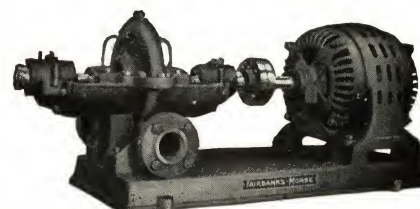
These engines are eminently suitable for all purposes where direct rope, belt or gear driving is required.

ELECTRIC GENERATING MACHINERY

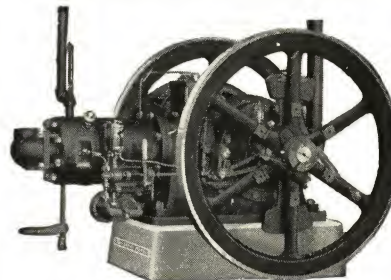
Allen electric generating sets are driven by steam engines, steam turbines or oil engines, and are made in all sizes.



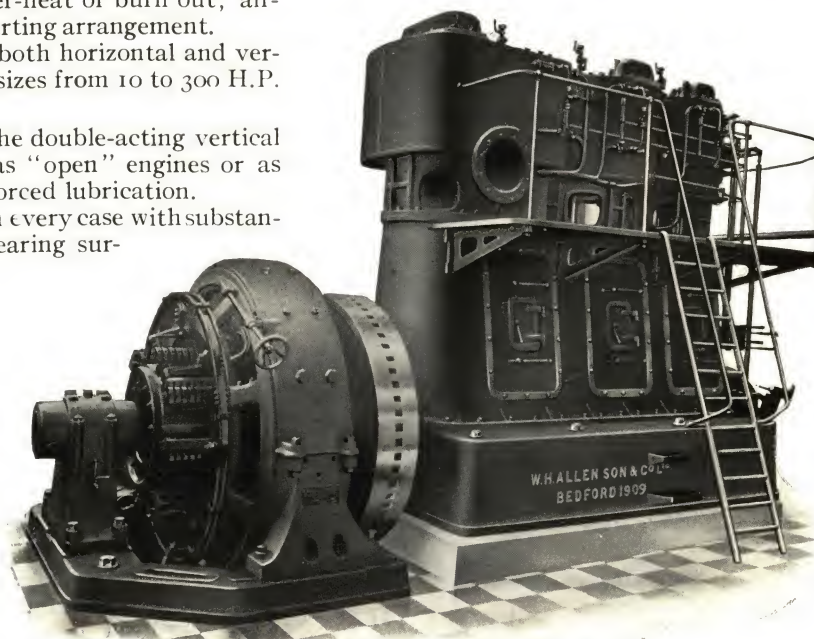
TYPE B. INDUCTION MOTOR.



3" SINGLE STAGE DOUBLE SUCTION CENTRIFUGAL PUMP DIRECT CONNECTED TO MOTOR.



TYPE "Y" OIL ENGINE



730 B.H.P. TRIPLE EXPANSION ENGINE

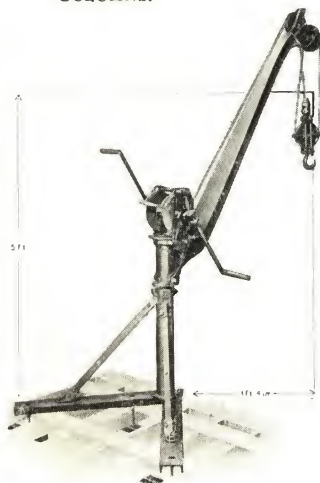
JOHN T. HEPBURN, LIMITED

ENGINEERS AND IRON FOUNDERS.

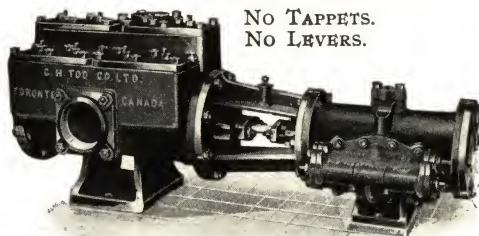
18-40 VAN HORNE ST.,
TORONTO.

GREY IRON CASTINGS.

BUILDERS SUPPLIES.
GRATE BARS.
COLUMNS.



PORTABLE DERRICK
for hoisting building material etc. Boom swings a complete circle. Capacity 900 lbs. Drum takes 300 feet of $\frac{1}{4}$ " wire rope.



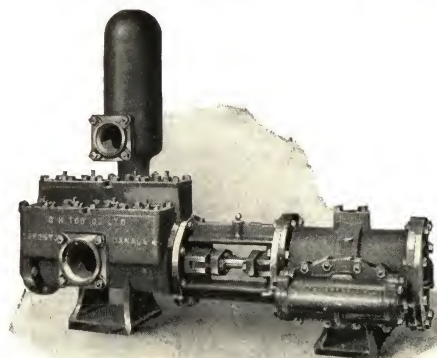
NO TAPPETS.
NO LEVERS.

VACUUM PUMP.

For heating systems; both high and low pressure. Valves are accessible and of the Pot Valve Type. These pumps are also used in conjunction with receivers into which the heating system drains. An automatic float valve starts up the pump when the receiver becomes full.

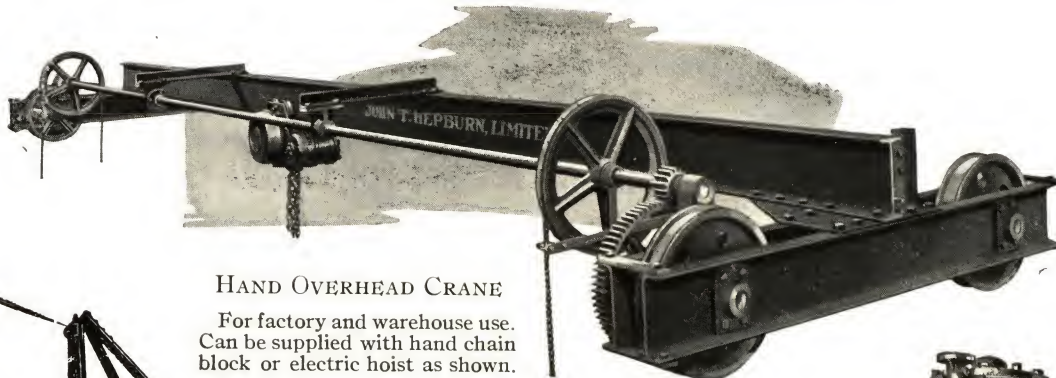
BLACKSMITH WORK.

HEAVY AND LIGHT FORGINGS
ACETYLENE WELDING.
SPECIAL MACHINE WORK.



FEED PUMP.

Simplex type with Patent Valve Motion. The only self-draining pump made in Canada. Long strokes for efficiency.



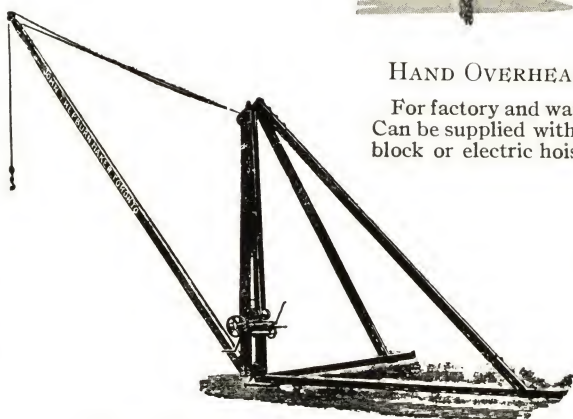
HAND OVERHEAD CRANE

For factory and warehouse use. Can be supplied with hand chain block or electric hoist as shown.



HYDRANT.

Standard size for 6" water mains and 6'-0" trench. Made complete with frost jackets and foot pipes.



HAND DERRICK.

Equipped for both hand and power. Built in sizes from $\frac{1}{2}$ ton to 6 ton capacity.



GATE VALVES.
For water mains.

We also make

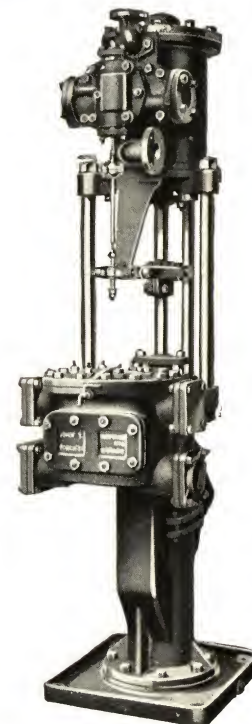
BRICK MACHINERY.

The Hercules Machine, Martin Machine, Pugmill, Mould Sander, Trucks and Vertical Engines.



ELECTRIC DERRICK.

The most modern derrick for builders and contractors, where electricity is available. Single motor drive, and easy to operate. Sizes up to 6 ton capacity.



VERTICAL RAM FEED PUMP.

Specially designed for high pressures and for water of high temperature. It has only one gland on the ram to need attention; takes little floor space, and is a most efficient pump in every way.

THE LANCASHIRE DYNAMO & MOTOR CO.

OF CANADA, LIMITED

45 NIAGARA ST., TORONTO.

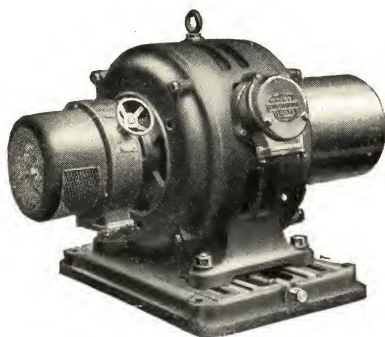
BRANCH OFFICE: 512 NEW BIRKS BLDG., MONTREAL.

PRODUCTS.

ALTERNATING AND DIRECT CURRENT MOTORS AND GENERATORS; LANCASHIRE BALL BEARING INDUCTION MOTORS; TURBO ALTERNATORS AND SYNCHRONOUS MOTORS; MOTOR GENERATOR SETS; AUTOMATIC REVERSIBLE BOOSTERS; LANCASHIRE PATENT ELECTRIC DRIVE FOR PLANERS.



STANDARD "LANCASHIRE"
PROTECTED TYPE, SQUIRREL CAGE
ROTOR MOTOR.



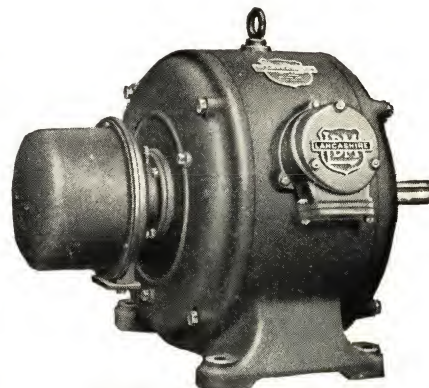
STANDARD "LANCASHIRE"
PROTECTED TYPE, WOUND ROTOR MOTOR.

LANCASHIRE "BALL BEARING" INDUCTION MOTORS.—Lancashire Induction Motors represent the highest standard of British manufacture.

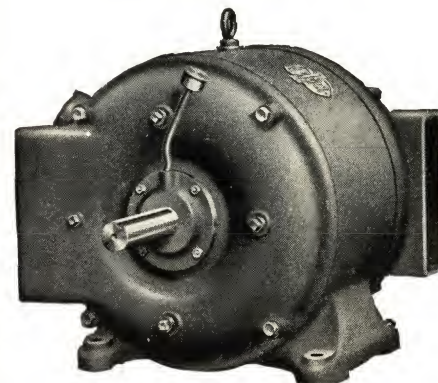
Covering a wide range of outputs, the motors are built to limit gauges in a large number of standard sizes, and absolute reliance may be placed upon the interchangeability of spare parts with the original.

In their manufacture the fact has not been overlooked that motors are often installed in inaccessible positions, where they must operate for long periods with very little attention, and every possible care is taken in connection with workmanship and the selection of materials to ensure that the motors will withstand the misuse to which they are often subjected, without breakdown.

"Lancashire" Induction Motors are characterized by a rigidity of construction and careful attention to detail that render them very attractive to those who require serviceable motors.



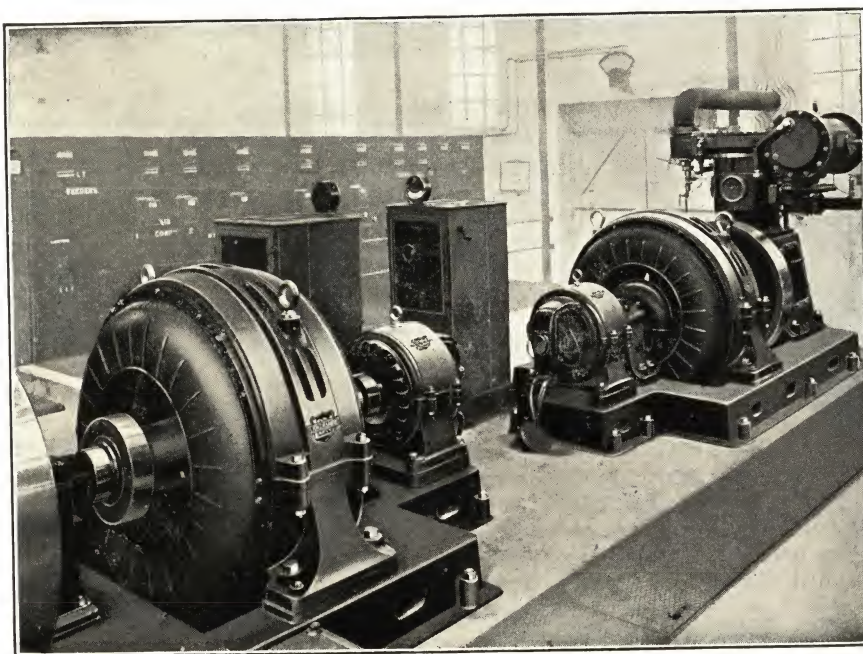
STANDARD "LANCASHIRE"
TOTALLY ENCLOSED MOTOR WITH
WOUND ROTOR.



STANDARD "LANCASHIRE"
PIPE VENTILATED OR FORCED DRAUGHT
MOTOR.

REPAIRS.

At Toronto we have one of the finest equipped repair shops in the Province, where we can repair, re-wind or rebuild all types of electrical apparatus.



TWO 100 B.H.P. LANCASHIRE SELF STARTING SYNCHRONOUS MOTORS DRIVING AIR COMPRESSORS.

"LANCASHIRE" SELF STARTING SYNCHRONOUS MOTORS.

Started like ordinary induction motors, these motors pull themselves into synchronism and no skilled attention is required.

Factories etc. troubled with low power will find these motors of service in driving fans, pumps, air compressors or line shafting, and at the same time improving the power factor of the whole system.

THE BRISTOL COMPANY

WATERBURY, CONN.,

U.S.A.

A. H. WINTER JOYNER LTD.

BRISTOL'S

REG. U.S. PAT. OFFICE.

62 FRONT STREET WEST,
TORONTO, ONT., CANADA.

NEW BIRKS BUILDING,
MONTREAL, QUE., CANADA.

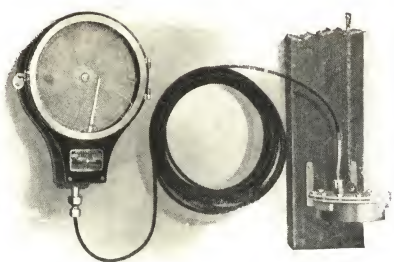
PRODUCTS.

RECORDING GAUGES, THERMOMETERS, PYROMETERS, PSYCHROMETERS, ELECTRICAL INSTRUMENTS, TACHOMETERS, ELECTRICAL AND MECHANICAL OPERATION INSTRUMENTS, TEMPERATURE CONTROLLERS, LIQUID LEVEL RECORDERS, LONG DISTANCE ELECTRICAL TRANSMITTING AND RECORDING SYSTEM, COUNTERS AND RADII AVERAGING INSTRUMENTS.



RECORDING PRESSURE AND VACUUM GAUGES.

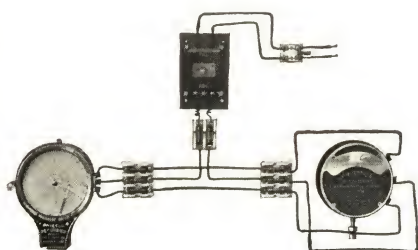
A permanent record of operating conditions in connection with steam, gas, air and liquids. Charts furnished to read in pounds, ounces, inches, feet, metric or any other desired units from full vacuum to 12,000 pounds per square inch. Complete information in catalogue AZ 1005.



LIQUID LEVEL RECORDERS.

For automatically recording depths of water or other liquids in tanks, water towers, reservoirs, etc. Can be located where most convenient at a higher or lower level than the liquid to be measured. Not affected by low temperatures. See bulletin AZ 278.

LONG DISTANCE ELECTRICAL TRANSMITTING AND RECORDING SYSTEM.



For measuring and recording at remote points, pressure, liquid level, temperature and motion. A distance of five miles or more is perfectly practical. This system is not complicated in design and is easily understood by anyone who may be made responsible for the maintenance of it. Get bulletin AZ 310.

RECORDING THERMOMETERS.

For all commercial ranges from 60 degrees below zero to 800 degrees Fahr. Furnished with plain bulbs for use in open spaces not under pressure or with screw bulbs for closed spaces under pressure. Used in connection with feedwater to boilers, superheated steam, milk pasteurizers, dry kilns, etc. Ask for catalogues AZ 1102-1202-1302.

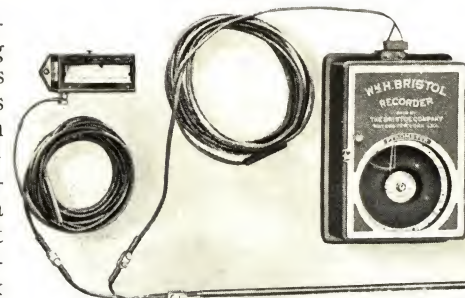


INDICATING AND RECORDING ELECTRICAL PYROMETERS.

High Resistance Model 319 for ranges up to 3000 degrees Fahr., with platinum couples or with base metal couples for ranges below 2000 degrees.



Combination Indicating and Recording Unit of pyrometers furnished when it is necessary to have an indicating instrument at the operator's station and a recording instrument for the superintendent in his office. Ask for bulletin AZ 291.



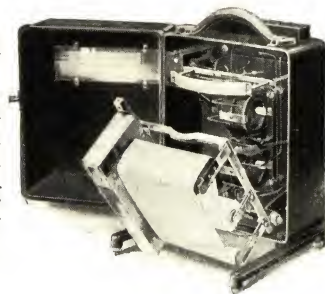
HIGH TEMPERATURE CONTROLLER

Thermo-Electrical Type supplied with electrical valves or switches to control furnaces heated by gas or electricity and for oil under certain conditions. Operates automatically and is very easily installed. See bulletin AZ 279.



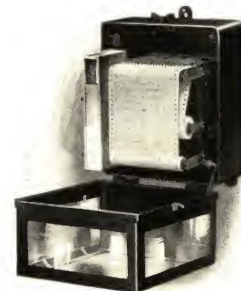
RECORDING WATTMETER STRIP CHART TYPE.

Portable Model for use on A.C. single or polyphase and on D.C. up to 400 amperes. Convenient and practical for making tests to obtain records of consumption of electrical energy. Ask for catalogue AZ 1501.



OPERATION RECORDER.

Shows time of mechanical movements, machine operations, valve reversals, etc. 20 different operations recorded on the same chart. Easy to install and to maintain in service. Insures a high rate of output continuously in connection with all of your machines. See bulletin AZ 207.



WESTON ELECTRICAL INSTRUMENT COMPANY

Weston

147 WESTON AVE., WAVERLY PARK,
NEWARK, NEW JERSEY, U.S.A.

Weston

TORONTO: A. H. WINTER JOYNER, LTD.
MONTREAL: NORTHERN ELECTRIC COMPANY.
WINNIPEG: NORTHERN ELECTRIC COMPANY.

VANCOUVER: NORTHERN ELECTRIC COMPANY.
CALGARY: NORTHERN ELECTRIC COMPANY.
HALIFAX: NORTHERN ELECTRIC COMPANY.

PRODUCTS.

Manufacturers of the WORLD'S STANDARD ELECTRICAL MEASURING INSTRUMENTS
FOR DIRECT AND ALTERNATING CURRENTS.



MODEL 267.



MODEL 269.



MODEL 271



MODEL 273.

FAN-SHAPED INSTRUMENTS
FOR D.C. SWITCHBOARDS

Weston

Indicating Switchboard Instruments are made in a large variety of shapes and sizes to meet every requirement of the switchboard designer and builder.

When preparing your specifications consult a Weston catalogue, and select the style of case and range best suited to the requirements, with full assurance that the interests of the client will thus be absolutely protected.

Made as AMMETERS, VOLT-METERS, WATTMETERS, POWER FACTOR METERS, FREQUENCY METERS, SYNCHROSCOPES, WATTLESS COMPONENT METERS and REACTIVE FACTOR METERS.

WESTON PORTABLE D.C. AND A.C. INSTRUMENTS ARE IDEAL FOR ALL TESTING.



MODEL 57.

ROUND-PATTERN INSTRUMENTS
FOR D.C. SWITCHBOARDS.



MODEL 343.

ROUND-PATTERN INSTRUMENTS
FOR A.C. SWITCHBOARDS.

INFORMATION. Write for Bulletins describing all Weston Products, or consult our nearest representative.

G. & J. WEIR (CANADA) LIMITED

HEAD OFFICE AND WORKS:
179 DELORIMIER AVE.
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Foundry:
VILLE LA SALLE, P.Q.

ENGINEERS AND FOUNDERS.

CANADIAN BRANCH OF
G. & J. WEIR LTD. CATHCART: GLASGOW

SALES ENGINEERS.
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BRANCH OFFICES:
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906 Bank of Hamilton
COBALT
Carr Block
VANCOUVER
418 Pacific Building
SUDBURY
61 Durham Street

PRODUCTS.

BOILER FEED PUMPS, RECIPROCATING AND STEAM TURBINE DRIVEN; GENERAL SERVICE PUMPS, FEED WATER HEATERS; CONDENSERS; EVAPORATORS; AIR PUMPS; VALVES; HIGH-GRADE CASTINGS IN IRON, MONEL METAL, BRONZE, ETC.

SERVICE.

We endeavour to co-operate with customers to furnish the most suitable equipment, and our aim is to place the resources of our whole organization, technical, commercial, manufacturing and recording, at the service of our customers to serve and assist them in whatever way we can.

WEIR STANDARD FEED PUMPS. SIZES, CAPACITY, &c.

SIZE.	NORMAL DUTY		MAXIMUM DUTY		SIZE OF BRANCHES				Code Word
	Imperial Gallons per Hour	D. S. per Min.	Imperial Gallons per Hour	D. S. per Min.	Steam	Exhaust	Suction	Discharge	
Pump. Cyl. Strk. Ins. Ins. Ins.					Ins.	Ins.	Ins.	Ins.	
2½ x 3½ x 5	270	30	340	38	½	½	1¼	1	Amain
3 x 4½ x 6	410	26	535	34	½	½	1½	1	Amalgam
4 x 6 x 7	660	20	810	25	¾	1	2	1½	Amateur
4 x 6 x 12	960	17	1,205	21½	¾	1	2	1½	Amazon
5 x 7 x 12	1,450	16	1,725	19	¾	1	2½	2	Ambient
6 x 8½ x 13	2,000	14	2,350	16½	1	1¼	3	2½	Ambler
6 x 8½ x 18	2,700	13½	3,350	16½	1	1¼	3	2½	Ambulant
7 x 9½ x 21	4,000	13	4,750	15	1½	1½	3½	3	Ambush
8 x 10½ x 22	5,500	12½	6,350	14½	1½	1½	4	3½	Amenable
9 x 12 x 24	7,200	12	8,100	13½	1½	2	4½	3½	Amount
10 x 13½ x 24	9,000	12	10,000	13½	1½	2	5	4	Amplify

STANDARD SIZES, CAPACITIES, &c., OF WEIR STANDARD SERVICE PUMPS.

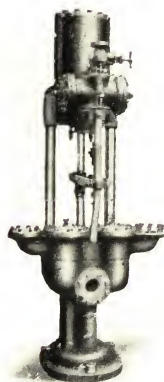
Diameter of Pump	Diameter of Cyl.	Length of Stroke	Capacity Tons per hour	Double Strokes per Min.	SIZE OF BRANCHES				CODE WORD
					Steam	Exhaust	Suction	Discharge	
Ins.	Ins.	Ins.			Ins.	Ins.	Ins.	Ins.	
4	3½	9	8	40	½	½	2½	2	Dogma
5	4½	12	16	38	¾	1	3½	3	Dolabra
6	5½	15	27	36	¾	1	4	3½	Donatist
7	6½	15	38	37	1	1¼	4½	4	Drachma
8	7	18	54	34	1	1¼	6	5	Drowse
9	8	18	74	36	1½	1½	7	6	Dualin
10	9	24	100	30	1½	1½	8	7	Ductile
12	10½	24	150	31	1½	2	9	8	Durable
14	12½	24	200	30	1½	2½	11	10	Dynasty

Special and larger sizes on application.

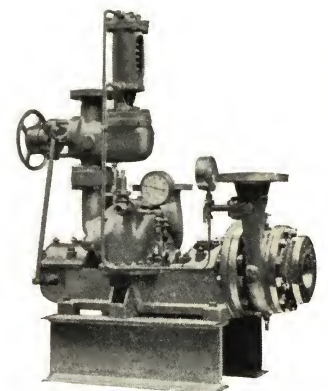
These pumps are capable of working with 200 lbs. steam against 90 lbs. per square inch.

CAPACITIES, &c., OF WEIR TURBO-FEED PUMPS.

TYPE	Capacity	Steam	Exhaust	Suction	Discharge	Weight	Code Word
	Imp. Gal. per hour	Ins.	Ins.	Ins.	Ins.	Lbs.	
TFP 7	7,000	1½	3	3	3	870	Prothellium
TFP 10	10,000	1½	3	3½	3½	910	Prothorax
TFP 15	15,000	2	4	4	4	1,120	Protogenal
TFP 20	20,000	2	4	5	5	1,170	Protracted
TFP 27	27,000	3	5	6	6	1,840	Protoplasm
TFP 35	35,000	3	5	7	7	1,960	Protruded



WEIR
DIRECT ACTING BOILER
FEED PUMP.



WEIR
TURBO FEED PUMP.

ESTIMATES, CATALOGUES, ETC., ON REQUEST.

FOXBORO
TRADE MARK

THE FOXBORO CO., INC.
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 PEACOCK BROTHERS LIMITED,
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 VANCOUVER - 418 PACIFIC BUILDING

FOXBORO
TRADE MARK

PRODUCTS.

FOXBORO RECORDING AND INDICATING GAUGES FOR PRESSURE AND VACUUM; RECORDING AND INDICATING THERMOMETERS; AIRPLANE THERMOMETERS; AIR-SPEED INDICATORS; RECORDING PSYCHROMETERS; AUTOMATIC TEMPERATURE CONTROLLER-RECORDERS; AUTOMATIC HUMIDITY CONTROLLERS; INDICATING AND RECORDING LIQUID LEVEL GAUGES; DIFFERENTIAL PRESSURE RECORDERS; FLOW METERS FOR GAS AND LIQUIDS; RADIAL PLANIMETERS; CO₂ RECORDERS FOR FLUE GAS ANALYSIS; INDICATING AND RECORDING PYROMETERS; TACHOMETERS; MECHANICAL AND ELECTRIC TIME RECORDERS; GAUGE BOARDS.

INDICATING AND RECORDING GAUGES.

INDICATING—All movements are absolutely non-corrosive and independent of the case. Perfect alignment of working parts insures accuracy.

Ammonia gauges and hydraulic gauges for pressures over 1,000 lbs. have nickel steel screwed tubes. Positively will not set or leak. (Bulletin B.D. 95-2.)

RECORDING—For steam, gas, water, air, oil, ammonia, brine, anything under vacuum or pressure; any range from full vacuum up to 20,000 lbs; any unit of measurement: inches water, ounces, pounds, feet, metric units, etc. New inverted type does away with blotted records and dirty pen arms. All gauges are equipped with patented chart holder; micrometer adjustment pen arm; automatic release pen lifter. All cases round-form and dust-tight. Also 2-pen recording gauges furnished to record 2 separate pressures on one chart. (Bulletin B.D. 98-2.)

INDICATING AND RECORDING THERMOMETERS.

INDICATING—Designed to eliminate excessive breakage. An instrument easy to read and of the long distance type as well as stem type. No mercury—the same principle applies as in the recording thermometer. (Bulletin B.D. 104-1.)

RECORDING—Depend upon expansion of liquids, gas and the vapor tension of volatile liquids for their action. Impossible to deteriorate with age.

No mercury used—effect of atmospheric conditions is thus eliminated. Connecting tube can be 300 ft. long and accurate results guaranteed.

The actuating movement is our improved helical tube movement. No multiplying devices are used.

Charts either even scale or increasing scale as desired. Bulbs made to suit any kind of application. Special lead and acid resisting bulbs are made for the chemical industry.

Also 2-pen and 3-pen recording thermometers, to record on one chart 2 or 3 separate temperatures, can be supplied. (Bulletin B.D. 104-1.)

AUTOMATIC TEMPERATURE RECORDER-CONTROLLER.

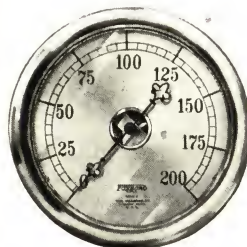
A new design in which the functions of two instruments have been combined and so co-ordinated that perfect synchronization is obtained. *The use of only one bulb to actuate both the recorder and the controller elements gives an accurate record of the controller operation.* Valves designed to operate on either pressure or vacuum. An improved form of rubber diaphragm motor is employed, which is so designed that, even under severe conditions, no undue stresses are set up in the diaphragm itself. (Bulletin B.D. 112-1 is all about this new instrument.)

LIQUID LEVEL GAUGES.

Both indicating and recording types.

Primarily designed for recording varying levels of rivers, reservoirs, canals, forebays, tail races, etc.; but have been widely adopted for sewer work, weir measurements, and specific gravity recorders. Paper mills use them to record the height of stuff in Jordan stuff chests, etc.

They are not affected by ice formation; can be used on liquids other than water; guaranteed for accuracy and will be sent on trial. (Complete list in Bulletin No. B.D. 82-1.)



INDICATING GAUGE.
 Sizes 2 to 24 in. Range, from full vacuum to 20,000 lbs. per sq. in.



INDICATING THERMOMETER.
 From -25° to +1000° Fahr., or corresponding degrees Centigrade or Reaumur



AUTOMATIC TEMPERATURE RECORDER-CONTROLLER.
 Will operate valves from 1/4 to 12 in. and on temperatures from -25° to +1000° Fahr. Set lever with cross arm at required temperature, and this temperature will be maintained automatically until setting is changed



RECORDING GAUGE.
 Sizes 8, 10 and 12 in. Any finish desired.



RECORDING THERMOMETER.
 Sizes 8, 10 and 12 in. From -60° to +1000° Fahr., or corresponding ranges in Centigrade or Reaumur.



LIQUID LEVEL GAUGE.

FOXBORO
TRADE MARK

SARCO CO., INC.

WOOLWORTH BUILDING, NEW YORK CITY.

CANADA:

PEACOCK BROS., LIMITED

MONTREAL AND TORONTO.

SARCO RADIATOR TRAPS.

The Sarco Radiator Trap, Type "E," is a development of the Sarco Steam Trap used everywhere for high and low pressure. It is factory adjusted and can be used on vapor or vacuum or any pressure up to 20 pounds. Absolutely no adjustment necessary. The thermo-element consists of a spirally corrugated tube large in diameter within which is contained a volatile liquid under vacuum. The expansion element is suspended from the bronze body and held in place by the cap.



One end of valve stem is fastened to expansion head; other end carries a special valve head. A cylinder strainer is fitted to body.

When steam is off, the valve is open. When steam comes in contact with outside of thermo element the volatile liquid is vaporized and the vapor pressure moves the valve downward to its seat. Valve remains closed until condensate reaches the trap, causing volatile liquid to condense and open valve. Steam closes valve and the cycle is repeated whenever condensate collects.

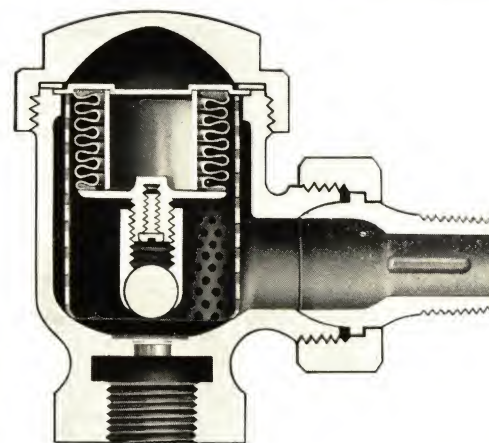
The Sarco Radiator Trap is made in two sizes, $\frac{1}{2}$ " and $\frac{3}{4}$ ", capacities up to 200 and 800 square feet direct C.I.

radiation, respectively.

SARCO RADIATOR TRAP SPECIFICATIONS

Size, inches	$\frac{1}{2}$	$\frac{3}{4}$
Length over all, inches	$3\frac{3}{8}$	$3\frac{3}{8}$
Distance, centre of Inlet to face of Outlet, inches	$1\frac{1}{2}$	$1\frac{1}{2}$
Distance, centre of Valve to face of Inlet, inches	$2\frac{3}{4}$	$2\frac{3}{4}$

Write for Steam Trap Bulletin.



TYPE E RADIATOR TRAP SECTION VIEW

SARCO BLAST TRAPS.

For drips, hot water heaters, heating coils, etc. Operate on the same principle as the Sarco Radiator Trap described above.

The body is of cast iron and the brass seats are renewable.

Sarco Blast Traps are made in sizes 1" to $2\frac{1}{2}$ " inclusive for pressures up to 20 pounds.

SARCO TEMPERATURE REGULATORS.

For maintaining a constant temperature of liquids and atmosphere. Substantially constructed on same thermo-static principle as the well-known steam trap Sarco (not illustrated or described here; full particulars furnished on request).

OPERATION—Slight increase in temperature of surrounding liquid or atmosphere expands operating fluid, producing a powerful hydraulic pressure tending to close valve; a decrease in temperature contracts fluid, and gradually opens valve.

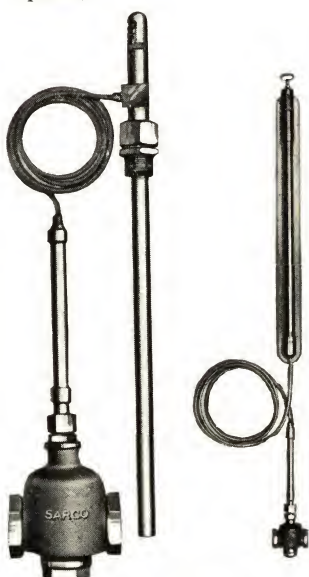
Sarco Regulators operate steam, water or gas valves.

USES.—They are being widely adopted and are suitable for public institutions, schools, hotels, packing houses, canning factories, bottling works, paper mills, gas condensers and producers, ammonia stills, hot water service tanks, blast heaters, etc.

TEMPERATURE CONTROL SPECIFICATIONS

Size, inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
Weight, lbs.	7	7	9	13	22	28	37	51	81	132	158
Face to face of Valve, ins.	$2\frac{1}{2}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$4\frac{1}{2}$	5	6	$7\frac{1}{4}$	$8\frac{1}{2}$	$13\frac{1}{2}$	$15\frac{1}{2}$	18

Sarco Thermometers are particularly applicable for use on hot water tanks and air duct temperatures. They are designed for industrial as well as scientific use and are guaranteed to be extremely accurate.



TYPE T.R. 21
FOR AIR DUCTS AND
TANKS.

TYPE K.R. 14
FOR ROOMS
AND KILNS.

SARCO THERMOMETERS.

The thermometer dial can be placed at any desired distance from the thermometer bulb. The connecting tubing can be exposed to wide temperature differences without affecting the accuracy of the temperature readings.

Practically any desired range from minus 90° F. to plus 1300° F. can be furnished. Write for information on the new Sarco Recording Thermometer.



SARCO INDICATING
THERMOMETER

BAILEY METER COMPANY LIMITED

179 DELORIMIER AVE.
MONTREAL

PRODUCTS.

METERS FOR STEAM, WATER, AIR AND GAS, BOILER METERS, V-NOTCH WEIR METERS, COAL METERS, ASH PIT LOSS RECORDERS, TACHOMETERS, MULTI-POINTER GAUGES FOR DRAFT, PRESSURE, TEMPERATURE, AND SPEED, SPECIFIC GRAVITY RECORDERS, DIFFERENTIAL RECORDERS.

Every detail of boiler operation can be indicated or recorded with Bailey Metering Equipment like that shown in accompanying cut, fig. 1.

The Boiler Meter records and totalizes steam flow, records air flow, flue gas temperature and coal feed. The relation of the steam flow and air flow records shows the combustion conditions, that is, whether the correct amount of air is being supplied for combustion. Hence when the steam flow and air flow pens are together, the correct amount of air is being supplied for maximum economy regardless of the rate of steam flow. The flue gas temperature and coal feed records complete the information necessary for keeping continuous efficiency and heat balance records of the boiler operation.

The Multi-Pointer Gauge is made with any number of pointers, from one to twelve. The scales which are illuminated from within have distinct graduations covering a ten-inch pointer motion, and are therefore easily read at a considerable distance. The six-pointer gauge here shown indicates steam pressure, feed water pressure, rate of flow of feed water, wind box pressure, fire box draft, and draft at damper. Any other desired factors may be indicated.

BAILEY FLUID METERS

accurately measure the rate of flow of steam, water or any other vapors or liquids flowing through closed pipes, with a wide range in the capacity and conditions of the flowing fluid. The Recorder is operated by the difference in pressure across an orifice held between a pair of flanges in the pipe line. The pressures from the two sides of the orifice operate a liquid-sealed bell which moves in direct proportion to the rate of flow. This bell actuates the pen which records the rate of flow directly in any desired units on a 12" uniformly graduated chart. Pressure and temperature records may be incorporated on the same chart with the flow.

BAILEY GAS METERS

record, and may also totalize, the rate of flow of gases, reading directly in thousands of cubic feet per minute or per hour. The charts are uniformly graduated with the proper scale, so that the meter reads directly without the use of factors.

THE BAILEY METER FOR COAL AND GRANULAR MATERIALS

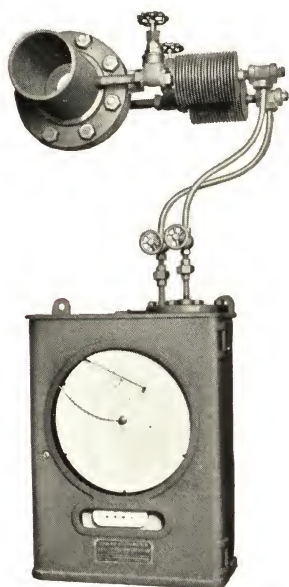
will meter coal, crushed ore and other granular materials with surprisingly accurate and consistent results when installed in a vertical pipe under proper conditions. Simplicity and durability are the two outstanding features of this type of meter.

Where it is desirable to measure the flow of water and certain other liquids at or near atmospheric pressure, the BAILEY V-NOTCH WEIR METER gives highly accurate and satisfactory results.

Write for bulletins describing BAILEY METERING EQUIPMENT, and see where you can increase your operating efficiency by controlling the preventable losses.



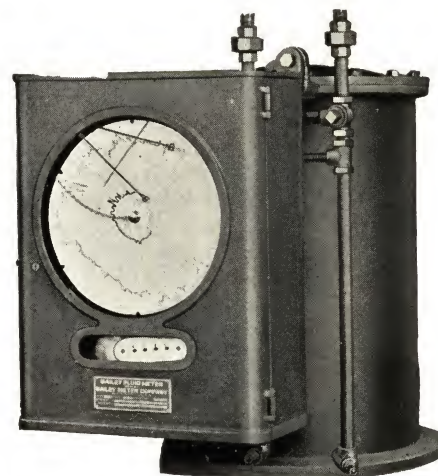
FIG. 1.
BOILER PANEL
CONSISTING OF BAILEY MULTI-POINTER
GAUGE, TYPE P6F, AND BAILEY BOILER
METER, TYPE D26, CLASS 511.



BAILEY FLUID METER
Type C6 Class 1



BAILEY COAL METER
Type V6



BAILEY GAS METER
Type C10 Class 3.



BAILEY WEIR METER
Type F4 Class 1

INFORMATION.

BUILDERS IRON FOUNDRY

"BUILDERS OF THE VENTURI."

MAIN OFFICE: PROVIDENCE, R.I.

CANADIAN REPRESENTATIVES:

ALLEN GENERAL SUPPLIES, LIMITED, TORONTO, ONT.

GENERAL SUPPLY CO. OF CANADA, LIMITED, OTTAWA, MONTREAL, WINNIPEG, VANCOUVER.



"VENTURI." Registered Trade Mark

PRODUCTS.

Manufactured by the Venturi Department: VENTURI METERS for cold water, hot water, gases, steam, etc.; VENTURI RATE of FLOW CONTROLLERS; VENTURI CHEMICAL FEED REGULATORS; LOSS OF HEAD GAUGES; WATER LEVEL RECORDERS for filtration plants.

VENTURI METER TUBE.

A Venturi Meter Tube is placed in a pipe line in the same manner as ordinary pipe. From the inlet to the throat the interior diameter gradually decreases and then gradually increases again to the full diameter at the outlet. The unobstructed passageway thus formed permits high differential pressure between inlet and throat with negligible friction loss. Annular pressure chambers are provided at inlet and throat. The throat is lined with bronze. Connection to the Indicating, Recording or Registering Instrument is simply made by two small pipes from the inlet and throat chambers.



VENTURI METER TUBE.

TYPE M REGISTER— INDICATOR— RECORDER.

The Type M Register-Indicator-Recorder furnishes three distinct kinds of information: it indicates momentary rate of flow through the Meter Tube; permanently records this rate upon a large circular chart; gives the total quantity on a circular counter dial. Each Register is graduated for the particular Meter Tube with which it is to be used.

For cold and hot water and other liquids, high pressure gases, steam, etc. Universally employed for main water supply lines, boiler feed, hot water heating systems, and many other important kinds of service.

The lower dial is 10 in. in diameter and indicates the rate of flow (pounds per hour, gallons per minute, etc.) through the Venturi Meter Tube. The upper dial records this rate continuously on a large circular chart. The interior mechanism is simply and positively actuated through large cast iron floats, resting on mercury columns, and rack and spur gearing.

TYPE M INDICATOR— RECORDER.

The Type M Indicator—Recorder may be used for the same kinds of service as the Type M Register and is also frequently employed for temporary installations at various points where it is desired to study the consumption or output through certain main pipe lines, or the efficiency of operation of important plant units.

The total quantity may be obtained by tracing the charts with a special planimeter manufactured by BUILDERS IRON FOUNDRY.

BULLETINS.

Bulletins describing the Venturi for hot and cold water, sewage, brine, chemical solutions, oil, gas, air or steam sent on request.

INSTALLATIONS.

Thousands of Venturi Meters varying in size from $\frac{1}{2}$ in. to $17\frac{1}{2}$ ft. in diameter are in use on all kinds of service throughout the world. The following are a few Canadian installations:—

MUNICIPAL INSTALLATIONS.

Over 100 Municipal pumping plants in Ontario as well as the principal cities throughout Canada.

BOILER FEED.

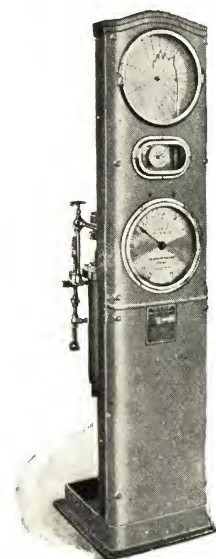
Goodyear Tire, Canadian Kodak, International Harvester, Beaver Wood Fibre, Imperial Oil (5 plants), St. Lawrence Sugar Refining Co., Dominion Sugar Co. (3 plants), Swift Canadian Co., Harris Abbatoir, etc.

STEAM METERS.

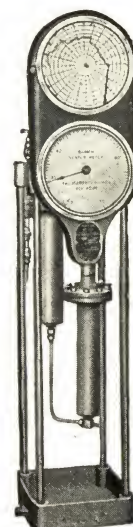
Toronto General Hospital, Imperial Oil (5 plants) and others.

GAS METERS.

United Gas & Fuel Company, Southern Canada Power-Steel Co. of Canada, Dominion Iron & Steel Co., Imperial Oil Co., etc.



TYPE M REGISTER—
INDICATOR—RECORDER.



TYPE M
INDICATOR—RECORDER.

NORTHERN EQUIPMENT COMPANY

MAIN OFFICE AND WORKS: 107 W. 11TH STREET, ERIE, PA.

BRANCH WORKS: HAMILTON, ONT.; CROYDON, ENGLAND; PARIS, FRANCE; COLOGNE, GERMANY.

SALES REPRESENTATIVES IN ALL INDUSTRIAL CENTRES

CANADIAN REPRESENTATIVES:

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H. N. BROWN, P.O. 620, New Glasgow,
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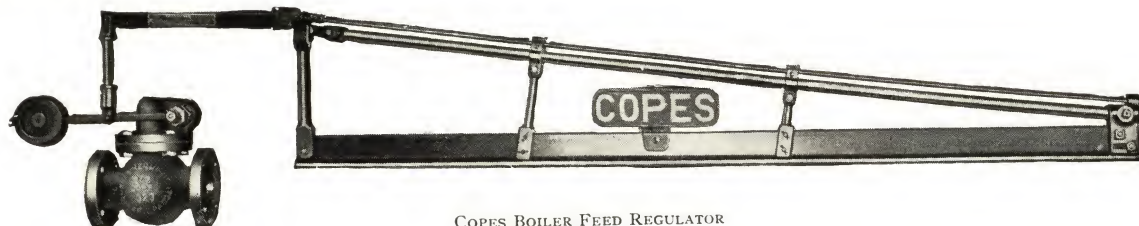
W. W. HICKS & Co., 567 Banning St., Winnipeg, Man.

PEACOCK BROS., 179 DELORIMIER AVE.,
Montreal, Quebec.

Write CHAS. C. MOORE & Co., Engrs., 618 Mutual Life Bldg., Seattle, Wash., if you reside in British Columbia.

PRODUCTS.

COPEs SYSTEM OF FEED WATER CONTROL, FEED WATER REGULATORS, PUMP GOVERNORS.



COPEs BOILER FEED REGULATOR

METHOD.

The regulator feeds continuously as long as there is a load on the boiler. On heavy loads it automatically drops the water level so as to increase the steaming capacity. On light loads it automatically raises the water level, and saves the furnace heat which would otherwise be wasted. On steady loads, it maintains a constant water level.

The Governor maintains a fixed excess in the feed line above boiler pressure. As the pressure varies, the feed pressure varies correspondingly. The same Governor, with a change in connections, will give a fixed constant pressure.

CONSTRUCTION.

A glance at the illustrations shows the simplicity of construction. The regulator—a straight tube, a straight lever, a heavy iron base, and a very rugged balanced valve that is practically frictionless. The Governor—a cylinder and piston, a frame, and a balanced valve. No springs, floats, diaphragms, displacement bodies, needle or pilot valves, or other delicate mechanism. Simple. Direct. Positive. Practically no repairs. Many have been operating daily for 20 years.

DESIGN.

Each Copes Regulator is now designed to suit the specific conditions governing the boiler, so as to insure the most economical feeding. The design is based on a study of the load conditions, feed line size, steam pressure, water pressure, etc. Provision is made for easy adjustment in case conditions change. Smooth feeding during light loads as well as heavy loads is insured by a high valve lift.

RESULTS.

Gives higher overload capacity. Removes unreliable human element from water control.

Eliminates danger while new employees are being "broken in."

Saves fuel—2% to 8%.

Even distribution of load between boilers.

Smooth rate of feed; more legible steam and water meter charts.

Smaller feed lines and valves.

More even load on feed pump.

Dry steam since the water level cannot exceed a predetermined level and because the level is a minimum for greatest loads.

Higher superheat because the water is not carried over into superheater tubes.

WHERE USED.

In 98% of the American plants where power is generated for sale at a profit. (Copes Regulators and Governors reduce costs and hence increase profits in those plants.)

By most of the leaders in practically every line of industry—in every part of America—in many foreign countries—out-of-doors at Duluth where the minimum temperature is 40° below zero—out-of-doors in India where the maximum temperature is 114° F.—in Mexico, Japan and China where the cheapest grades of labor are used—in the model plants of America and England where the highest grades of labor are employed—on 10 H.P. boilers—on 5,000 H.P. boilers—on Lancashire, Heine, Stirling, B. & W., Erie City, Rust, Wickes, Cahall, Manning, Union, Franklin, Badenhause, Keeler, Edgemoor, and practically every known type of boiler—on steady loads—on widely fluctuating loads. Briefly, Copes Regulators are used wherever boilers are used to generate steam for power purposes.

CATALOGS.

Ask for complete catalog, specifications, quotation, charts, test data, etc. Give us your boiler conditions in detail.



COPEs PUMP GOVERNOR.

D. K. McLAREN, LIMITED

MANUFACTURERS "GENUINE OAK" LEATHER BELTING.



HEAD OFFICE AND FACTORY:
351 ST. JAMES ST., MONTREAL.

BRANCHES: ST. JOHN, N.B.; TORONTO, ONT.; VANCOUVER, B.C.



MADE IN CANADA



FROM BRITISH STOCK

LEATHER
BELTING.

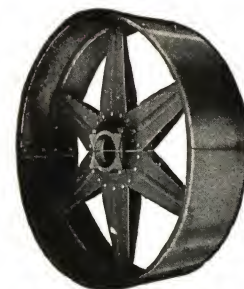
OUR CLAIMS are more solid leather to the foot than any other belt made. Because—The most vigorous system of inspection and classification of hides and leather has been our reputation for years. No Shoulders, Necks or Bellies to use, all hides being Close Trimmed. Special Belts for Special Conditions. Extra C quality stocked at all our Branches. Waterproof Belts made to order.



STEEL SPLIT
PULLEYS.

In placing this Brand of Belting before the public we do so with full confidence, it being manufactured solely for us by a firm with a well known reputation, backed by our own trade mark every 10 feet.

In presenting the above make we do so as sole agents. The Hub is strong and substantial, cast iron, easily bored true, tightened by four hub bolts. The rim is formed from one solid sheet of steel double thickness without rivets on face.



STEEL SPLIT PULLEY.

WOOD SPLIT
PULLEYS.

In submitting the D. K. pulley we have no hesitancy in proclaiming it the best on the market, built in sections nailed and glued. The spokes are white oak, built into the rim, the width of the arm being in proportion to the width of face.



WOOD SPLIT PULLEY.

BELTING
ACCESSORIES.

We carry the Largest Assortment of any firm in the Dominion, viz.:—Alligator Lacing, Bristol, Clipper, Crescent, Blake Studs, Jewell, Jackson, Talcott, Smith, Wire, Raw Hide, Chrome, Oil Tanned Lacing, cut or in sides.

SUPPLIES:

COTTON MILL:
Card Clothing.
Card Combs.
Card Hammers.

WOOLEN MILL:
Wire Goods of all descriptions.
Pickers, Heddles.
Picker Sticks.

CATALOGUE AND PRICES FURNISHED ON APPLICATION.

CANADIAN SKF COMPANY LIMITED

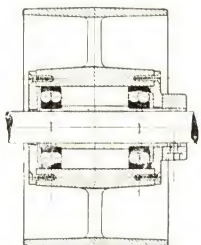
83 KING ST. W. TORONTO.

412 JAMES ST. MONTREAL.

SKF

PRODUCTS

include bearings and transmission equipment for all types of machinery and shafting, in every branch of industry. **SKF SERVICE** is a source of practical assistance whenever bearing problems arise in your plant—bringing to you an experience gained in every quarter of the globe. Our advice is at your disposal.



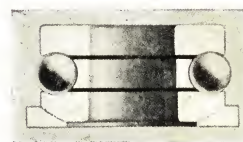
BALL BEARING LOOSE PULLEY



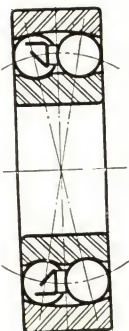
FLAT SEATED THRUST BEARING



BALL BEARING PILLOW BLOCK



SPHERICAL SEATED THRUST BEARING



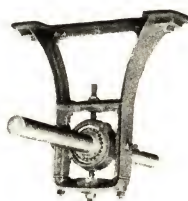
SELF ALIGNING BALL BEARING



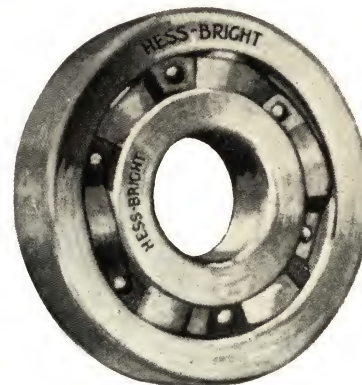
SELF-ALIGNING ROLLER BEARING



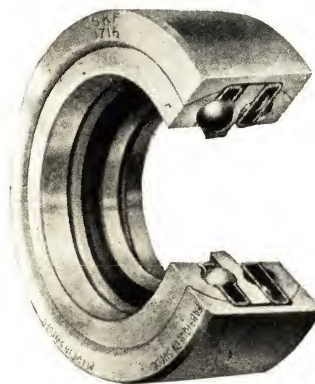
CYLINDRICAL ROLLER BEARING

BALL
BEARING
DROP
HANGER

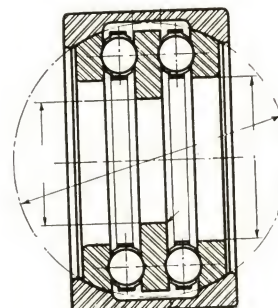
RIGID SINGLE ROW DEEP GROVE BEARING



NORMA BALL BEARING



SELF-ALIGNING THRUST BEARING



McFARLANE-DOUGLAS CO., LIMITED

MONTREAL OFFICE:
34A DORCHESTER WEST

SHEET METAL BUILDING MATERIALS
SLATER STREET, OTTAWA, CAN.

MANUFACTURERS
AND
CONTRACTORS



A SERVICE THAT IS NATION-WIDE

"CROWN" METAL PRODUCTS.

HOLLOW STEEL DOORS AND INTERIOR TRIM, METAL COVERED DOORS, WINDOWS AND TRIM, UNDERWRITERS' TIN CLAD DOORS, FIREPROOF WINDOWS, SKYLIGHTS, VENTILATORS, CORNICES, GARBAGE CANS, EAVE TROUGH, CONDUCTOR PIPE, METAL SHINGLES, METAL SIDINGS, METAL CEILINGS, CORRUGATED IRON, PLASTER BEAD, ZINC ORNAMENTS, GALV. IRON ROOFING, COPPER ROOFING, FELT AND GRAVEL ROOFING, SLATE ROOFING, CLAY TILE ROOFING.

FORT GARRY HOTEL.

The beautiful Fort Garry Hotel, Winnipeg, is one of a series of buildings stretching from coast to coast on which the service of this organization was employed. The "Crown" products specified included Felt and Gravel Roofing, Copper Roofing, Kalamein Windows, Doors and Trim (Bronze).

SERVICE.

Architects are every day specifying these "Crown" products because they have become staple materials in the construction of modern buildings; and McFarlane-Douglas Co. are rendering a much appreciated service in supplying specially trained workmen to carry out the work.

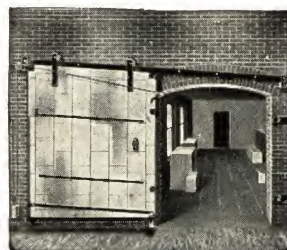


OTHER RAILWAY HOTELS ON OUR LIST INCLUDE

C.P.R. HOTEL VANCOUVER,
VANCOUVER, B.C.
C.P.R. PALLISER HOTEL,
CALGARY, ALTA.
G.T.R. HOTEL McDONALD,
EDMONTON, ALTA.
G.T.R. CHATEAU LAURIER,
OTTAWA, ONT.
C.P.R. CHATEAU FRONTENAC,
QUEBEC, QUE.
C.P.R. ALGONQUIN HOTEL,
ST. ANDREWS, N.B.



"CROWN" ALL-STEEL DOORS
AND TRIM finished to Archi-
tect's selection.



"CROWN" TIN-CLAD FIRE DOORS
are made in all styles, and carry the
Fire Underwriters' Label.



KALAMEIN DOORS AND
TRIM made to Architect's
detail and finished as de-
sired.

It will be a pleasure for us to co-operate to the limit. What are your wishes?



TRUSSED CONCRETE STEEL COMPANY

OF CANADA, LIMITED

WALKERVILLE, ONTARIO

MONTREAL

TORONTO

WINNIPEG

CALGARY

VANCOUVER

WAREHOUSES AT

TORONTO

WINNIPEG

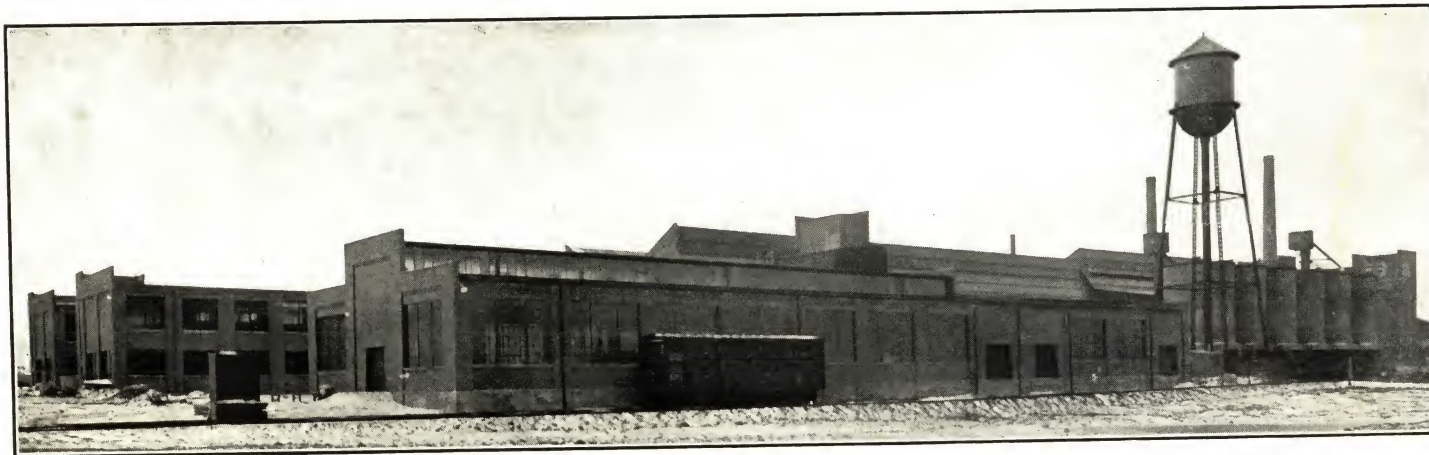
CALGARY

MONTREAL



Truscon
BUILDING
PRODUCTS

For modern permanent construction cover Reinforced Concrete in all its phases;
Steel Window Sash of every type; Metal Lath for Plaster and Stucco; Concrete
Highway Reinforcement; etc.



THE DeVORE COMPANY, INDUSTRIAL ENGINEERS AND ARCHITECTS.

CANADIAN LIBBEY-OWENS SHEET GLASS COMPANY, LIMITED, HAMILTON, ONTARIO.

TRUSCON CONTINUOUS SASH IN THE SIDEWALLS AND MONITORS AFFORD EXCEPTIONALLY LARGE OPENINGS FOR THE INTAKE OF FRESH AIR AND THE EXIT OF FOUL GASES AND HOT FUMES CONTINUALLY BELCHING FROM THE GLASS MACHINES.

Truscon DAYLIGHT SASH.

TRUSCON DAYLIGHT SASH for Factories, Power Houses, Warehouses, etc.

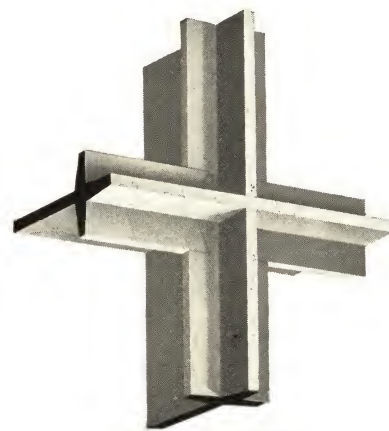
Truscon Daylight Sash fulfils the modern requirements of all buildings where maximum daylight, proper ventilation and permanency are desired.

This product is made up of specially rolled sections of the best grade of mild steel.

The joints are so constructed that maximum strength is secured throughout the sash, and weather-proofness is assured.

Ventilation of any required type and area can readily be provided. All ventilators are of Two Point Contact, are hinged on Truscon Patent Hinges—which cannot be put out of order.

Spring glazing clips are provided for all Truscon Daylight Sash. The clips are forwarded with other fittings, and adapt themselves to all thicknesses of glass. All types of glass can be used in Truscon Daylight Sash.



TRUSCON SASH JOINT.

Truscon STEEL BASEMENT WINDOWS.

Truscon Steel Basement Windows fill a long felt want for the builder of dwellings. They have hinges and lock attached and are supplied complete with glazing clips and lugs for embedding into the concrete, and are painted ready for installation just as they come from the factory.

Standard Sizes—27" high x 32" wide - 3 lights $9\frac{1}{2}"$ x $24\frac{1}{4}"$
" " $18\frac{3}{4}"$ " x $33\frac{1}{4}"$ " - 3 " $10"$ x $16"$

Cost approximately the same as wood windows.

We recommend the use of Truscon Self-Hardening Metal Sash Putty in glazing all steel sash.

We also manufacture Steel Sash Partitions, Sliding and Swinging Doors.

See also our advertisements on pages 18-19.

DOUGLAS BROS., LIMITED

124 ADELAIDE ST. WEST,
TORONTO, ONT.

10 BENOIT STREET,
MONTREAL, QUE.

PRODUCTS.

Manufacturers of UNDERWRITERS' STANDARD FIRE-DOORS; METAL WINDOWS; KALAMEIN IRON, COPPER AND BRONZE DOORS; SKYLIGHTS; SHEET METAL AND ROOFING WORK.



SERIES OF KALAMEIN COPPER DOORS AND TRIM INSTALLED BY US IN SHEA'S THEATRE, TORONTO.

FACILITIES.

Our entire organization is made up of skilled mechanics with lifelong experience.

We carry a large stock of standard mouldings, jambs and trim, and are in a position to produce anything of a special nature required.

ESTIMATES.

We will gladly submit estimates on receipt of architects' plans and specifications, or from rough sketches. Send us your enquiries.

IMPORTANT CONTRACTS

Crane & Co., Ltd., Warehouse.....	Montreal, Que.
Singer Mfg. Co.....	St. Johns, Que.
King Edward Hotel.....	Toronto, Ont.
Canada Bread Co., Ltd.....	Toronto, Ont.
Chateau Frontenac Hotel.....	Quebec, Que.
Banff-Springs Hotel.....	Banff, Alberta.
National Transcontinental R'y Shop.....	Quebec.
Adams Furniture Co., Ltd.....	Toronto, Ont.
C.P.R. Angus Shop.....	Montreal, Que.
Merchants Bank King Street.....	Toronto, Ont.
Belgo-Canadian Pulp & Paper Co., Ltd.	Shawinigan Falls, Que.



KALAMEIN IRON DOORS, TRIM AND FANLIGHTS, INSTALLED BY US THROUGHOUT THE KENT BUILDING, TORONTO.

CANADIAN METAL WINDOW AND STEEL PRODUCTS, LIMITED

OFFICE AND FACTORY: 160 RIVER STREET, TORONTO.
MONTREAL OFFICE: 169 PEEL STREET.

AGENCIES: R. R. POWER, Metropole Building, Halifax, N.S.; R. N. M. ROBERTSON, P.O. Box 1053, St. John, N.B.; W. J. BANKS, St. John Street, Quebec, P.Q.; R. Y. KILVERT & Co., 402 Builders Exchange, Winnipeg, Man.; A. L. CHARLEBOIS, Ave. J and 20th Street, Saskatoon, Sask.; GORMANS LIMITED, Edmonton, Alta.; Calgary, Alta.; Vancouver, B.C.



FIVE ESSENTIALS OF STEEL SASH CONSTRUCTION.

The experience of successful architects and engineers proves that there are five main essentials of steel sash:

1. Sufficient strength at the joint.
2. Strongly attached and well weathered butts.
3. Weathering constructed to effectively resist storms.
4. Fittings that stay on and provide ready and efficient operation.
5. Strong mullions—weather resisting and easy to erect.

How well FENESTRA measures up to each of these requirements is shown below:

THIRTY PER CENT. MORE STRENGTH AT THE JOINT.

The FENESTRA Joint is a patented interlocking of vertical and horizontal bars which permits them to run continuously from head to sill and from jamb to jamb. This interlocking method retains 30% more steel than any other method of joining and gives the sash maximum strength against wind pressure and wind suction.

The machine-cut bars fit together with an absolutely tight and weather-proof union which makes welding unnecessary and reduces to a minimum the opportunity for corrosion.

The graceful outward curve of the vertical nuntin at the inter-locking point increases the beauty of the sash and provides a guard which guides water away from the joint.

RIGIDLY ATTACHED, WEATHER-PROOF BUTTS:

All ventilators are horizontally pivoted 2" above centre, by means of two external, adjustable, solid steel butts.

Each section of the butt has a projecting "ear" which extends beyond the plane of the sash. Through these "ears" the butt bolt is passed, giving a pivot that is external and therefore easily accessible.

A slot in the projecting "ear" of the butt member attached to the sash permits easy adjustment up or down and the ventilator can be lifted from the sash entirely by merely removing the butt bolts.

The construction of the butt members is such that an aperture is left, through which condensation at the upper part of the ventilator follows the weathering down to the sill and escapes outward through the weep holes.

FENESTRA engineers, by designing a butt with a projecting ear, made possible two improvements:

- 1st—The new design permitted the riveting of each butt member through both weathering and sash bar, thus insuring a sturdy and durable attachment.
- 2nd—It permitted the use of springy steel channel weathering, which insures tight contact of the ventilator against the sash.

EFFECTIVE VENTILATOR WEATHERING.

In designing steel members that form a contact where no friction occurs, engineers consider straight edges and flat surfaces as the most effective method of weathering.

FENESTRA ventilators are built in strict accordance with this well recognized principle, the various FENESTRA bars used at the head, jams and sill being so assembled, that as the ventilator closes, two flat surfaces on the ventilator come into actual and positive contact with two flat surfaces on the sash.

This gives two point, flat contact weathering all around the ventilator.

At the butt the weathering members are so constructed that the upper portion completely overlaps the lower portion when the ventilator is closed.

DURABLE AND EASILY OPERATED HARDWARE.

THE FENESTRA CAM LATCH.

THE Z BAR BRACKET.

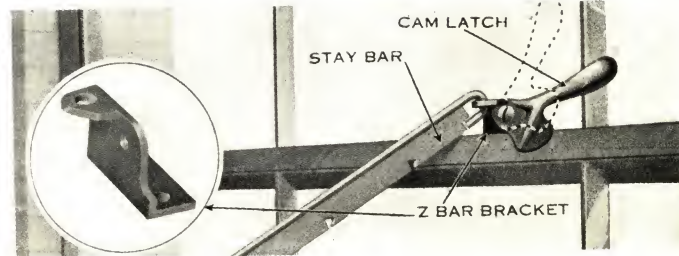
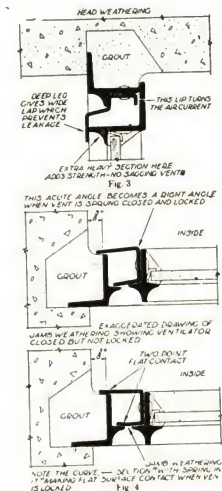
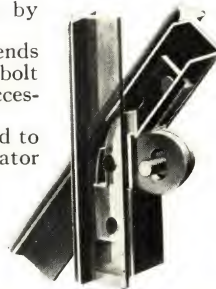
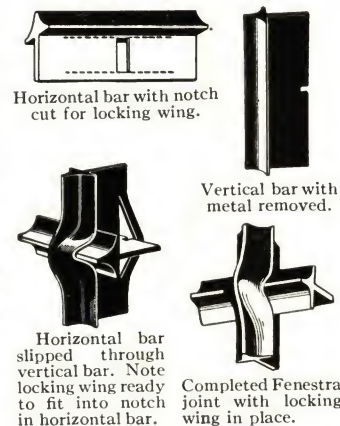
STRONG, EASILY ERECTED MULLIONS.

Engineers and architects have demanded a self-operating and fool-proof method of locking ventilators in place. This demand has been supplied in the FENESTRA cam latch (Part 467), which is of pleasing design, strong and substantial, and is attached to a solid rolled Z bar bracket which is securely riveted to the bottom rail of the ventilator.

In closing the ventilator—the cam latch rides up over the weathering and falls inside, locking the window.

FENESTRA operating hardware is attached to the ventilator by the Z bar bracket. This is a solid steel section rolled with a filet in each corner which gives it double thickness at this point and, therefore, greater strength than can be obtained in any other way. The bracket is securely attached to the bottom section of the ventilator by means of three rivets and cannot work loose.

Two or more units of FENESTRA sash may be combined in the same opening by joining them with our T. bar mullion. Absolute weather resistance is assured because of the wide, flat contact between the mullion and the sash—a lap of 1". Strength is provided in two directions, an adequate guard against bending or distortion. Erection is made easy. Just place the sash side by side—bolt the mullion between. Bolts are accessible—sash easily removed.



ARCHITECTURAL BRONZE & IRON WORKS

830 LANSDOWNE AVENUE,
TORONTO, ONT.



SARNIA COLLEGIATE AND TECHNICAL SCHOOL
S. B. COON & SONS, ARCHITECTS.

ILLUSTRATION.

The above school is one of a great many schools recently installed with our Abiway Steel Casement Sash. This sash is especially designed for school buildings, and has proved so satisfactory that it is being used very extensively by architects who specialize on schools.

Below we give a list of schools for which our sash have been used:

SCHOOLS	LOCATION	ARCHITECTS
Sarnia Collegiate and Technical School.....	Sarnia.....	S. B. Coon & Sons
Humber Heights Continuation School.....	Etobicoke.....	S. B. Coon & Sons
Mount Dennis School.....	Mount Dennis.....	S. B. Coon & Sons
South Wellington School.....	South Wellington.....	S. B. Coon & Sons
Bishop Ridley College.....	St. Catharines.....	Sproatt & Rolph
Collegiate Institute.....	London.....	L. E. Carrothers
Ealing School.....	London.....	L. E. Carrothers
London Road School.....	Sarnia.....	Chester Woods
Horner Ave. School.....	Long Branch.....	Smith & Wright
North Toronto High School.....	Toronto.....	Board of Education
Glace Bay School.....	Glace Bay, N.S.....	J. L. Wortham
Burford High School.....	Burford, Ont.....	F. Nicholls
Ottawa Collegiate Institute.....	Ottawa.....	J. A. Ewart
McGill University Library.....	Montreal.....	Nobbs & Hyde

We have recently closed contracts for:

Riverdale Technical School.....	Toronto.....	Board of Education
St. Catharines Collegiate and Vocational.....	St. Catharines.....	S. B. Coon & Sons
Scarboro High School.....	Scarboro.....	Burden, Gouinlock & Carter
Lambton Park School.....	Lambton.....	Smith & Wright
Stayner High School.....	Stayner.....	Smith & Wright

We have the distinction of being the only steel casement sash makers in Canada. We solicit your enquiries for Canadian-made Steel Casements as good as made anywhere in the world.

See also our advertisement page 112.

JOHN HILLOCK & CO., LIMITED

OFFICE, SHOWROOM AND FACTORY:

154 GEORGE STREET, TORONTO., CANADA.

SPECIALISTS IN MADE-TO-ORDER EQUIPMENTS, ALSO CARRY STOCK LINE.

"ARCTIC" REFRIGERATORS. We specialize in made-to-order equipments, building refrigerators for every use, household, institutions, catering and stores of every kind.

COLD STORAGE DOORS.

We build cold storage doors and install insulations. Doors are fully set up, including all frames, jambs and hardware complete, ready to screw into place. We manufacture our own hardware. Note the illustration of our new "Never Open" Door and the Montreal Harbour Building, the largest and most up-to-date storage house on the continent, fully equipped with the "Arctic" Never-Open Door.

CAFETERIA AND RESTAURANT SUPPLIES.

We build and install complete Cafeteria and Restaurant equipment, using best quality and highest grades of silver and white glass.

We will make you plans and estimates for your complete equipment.

Our catalogues and designing department at your service.

Write for catalogues, prices and full information of our line.

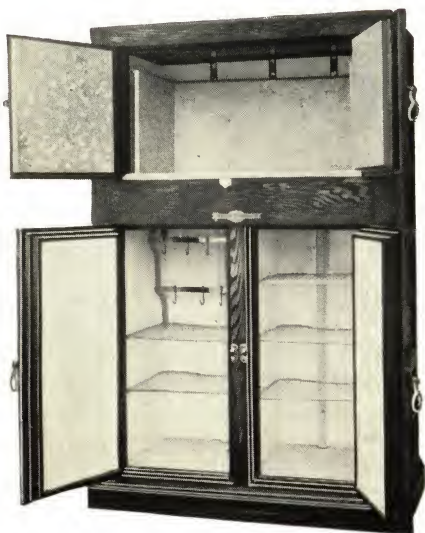


"ARCTIC" COLD STORAGE DOOR.

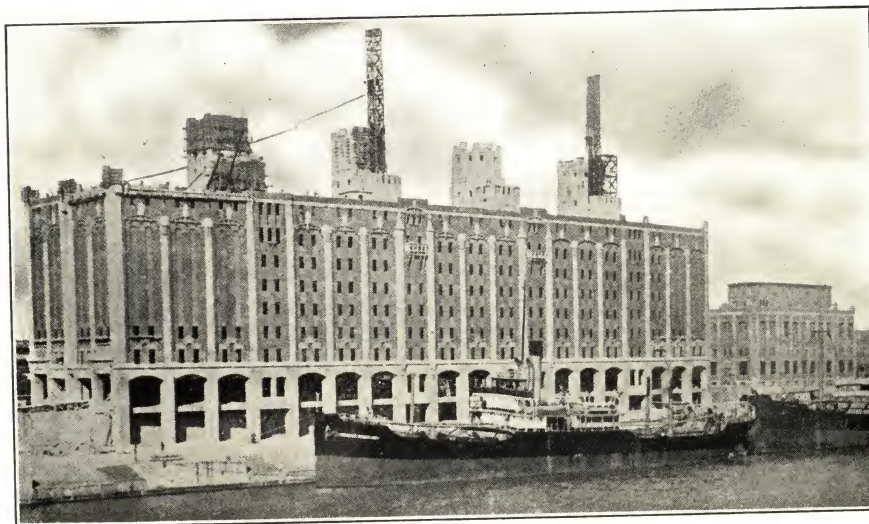


THE "NEVER-OPEN" COLD STORAGE DOOR.

can be attached to any cold storage door, keeps your cold room temperature down; you do not require the space-wasting vestibule. Press the inner doors by hand or with a truck and you release the fastener of the heavy door, and you pass out, and the space is automatically shut behind you. No springs to get out of order. Heavy galvanized iron protection facings.



"ARCTIC" HOUSEHOLD REFRIGERATOR.



COLD STORAGE BUILDING, MONTREAL HARBOUR, EQUIPPED WITH THE "ARCTIC" NEVER-OPEN COLD STORAGE DOOR.

THE GOLDIE & McCULLOCH CO., LIMITED

HEAD OFFICE AND WORKS: GALT, ONT., CANADA.

WESTERN BRANCH:
248 McDermott Ave.,
WINNIPEG, MAN.

TORONTO OFFICE:
1101-2 Bank of Hamilton Bldg.

QUEBEC AGENTS:
ROSS & GREIG, 400 St. James St.,
MONTREAL, QUE.

BRITISH COLUMBIA AGENTS: ROBT. HAMILTON & Co., Bank of Nova Scotia Bldg., VANCOUVER, B.C.

B.C. SAFE AGENT: C. L. FORD, 569 Richards St., Vancouver, B.C. MARITIME SAFE AGENT: E. L. STAILING, 65 Granville St., Halifax, N.S.

PRODUCTS.

FIRE-PROOF SAFES, BANKERS SAFES, FIRE-PROOF VAULTS & DOORS, VAULT LININGS, VAULT GRILLS, SAFETY DEPOSIT BOXES, STATIONARY & PORTABLE PRISON CELLS & POWER PLANT EQUIPMENT.

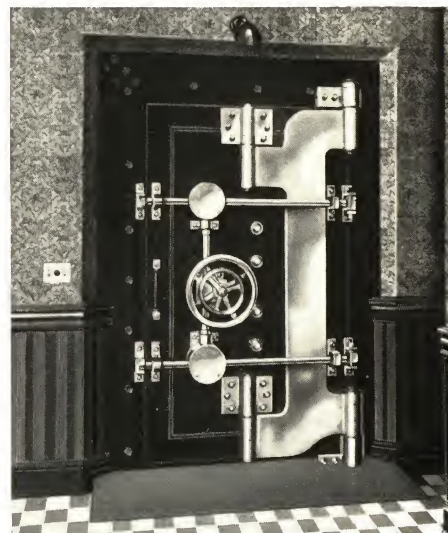
FIRE-PROOF SAFES AND VAULT DOORS

We build the old line, Iron thick wall safes. They have positively proven their worth in Canada's biggest and hottest Fires during the last Forty Years. Architects are taking big chances when they specify equipment about which there may be at least an element of Doubt.

Specify G. & McC. Safes & Vault Doors, the product which has been built in Canada since 1879 and has positively proven its worth.

BANKERS SAFES AND VAULT DOORS.

A great many of Canada's leading monetary Institutions are equipped with G. & McC. Safes & Vaults because of the high quality in design and workmanship which makes them as nearly as possible impregnable.



CLOSED VIEW, BANK OF MONTREAL VAULT, TORONTO, ONT.



ONE OF THE NEW VAULTS RECENTLY INSTALLED AT THE MUTUAL LIFE, WATERLOO, ONT.



THE ABOVE VAULT WITH OUTER AND INNER DOORS OPEN, GRILL GATE CLOSED.

ILLUSTRATIONS.

The illustrations show a couple of our most recent installations and the generally handsome & modern appearance of our heavy weight Bankers Vault Doors.

SPECIFICATIONS AND CONSTRUCTION PLANS

We are always glad to supply Architects and others complete specifications, plans, photos, etc. covering contemplated work and we have issued solely for the use of Architects & Contractors standard letter size suggestive plans covering both brick and Concrete Vault Construction. A supply of these plans will be mailed free on request.

CATALOGUE.

If you don't happen to have our safe catalogue on file be sure to ask for a copy.

POWER PLANT EQUIPMENT.

See our Advertisement page 199.

J. & J. TAYLOR, LIMITED

BRANCHES:

MONTREAL—220 Notre Dame West
WINNIPEG—60 Princess St.
VANCOUVER—524 Richard St.

TORONTO SAFE WORKS

ESTABLISHED 1855.

HEAD OFFICE AND WORKS:

137-147 FRONT ST. E.
TORONTO.

SOME USEFUL INFORMATION FOR ARCHITECTS

VAULT DOORS.

SPECIFY—	Cat. No.	Size exclusive of Frame	Vestibule Wall Thickness	Size opening to leave in wall.	The heights given are from the threshold. Threshold should be left $2\frac{1}{2}$ " above office floor.
For Basements	63 B	6' 0" x 2' 6"	18" unlined	6' 3" x 2' 9"	—Fireproof only; plain and inexpensive.
For Offices	64 C	6' 6" x 2' 6"	18" steel lined	6' 9" x 2' 9"	—Best type of Fireproof door.
For Branch Banks	72 A	6' 6" x 2' 8"	20" steel lined	6' 9" x 3' 1"	—Fire and partially burglar proof.
For Larger Banks	72 B	6' 6" x 3' 0"	22" steel lined	6' 9" x 3' 5"	—1 $\frac{1}{8}$ " thick; has crane hinge, etc.
For " "	70	6' 6" x 3' 0"	22 $\frac{1}{2}$ " steel lined	6' 10" x 3' 8"	—2 $\frac{1}{2}$ " thick; has crane hinge, etc.
For " "	71 A	6' 10" x 3' 4"	26" steel lined	7' 6" x 4' 6"	—3 $\frac{1}{2}$ " thick; has crane hinge, etc.

STEEL VAULT LININGS

Made any size and shape; but for convenient placing of Safes, Deposit Boxes, Shelving, etc., should not be less than 7' 6" wide x any depth. For average branch banks they are of Bessemer steel $\frac{1}{4}$ ", $\frac{3}{8}$ " or $\frac{1}{2}$ " thick. More important branches have $1\frac{1}{8}$ " or $1\frac{1}{2}$ " thickness, with centre layer of drill-proof chrome steel.

DEPOSIT BOXES.

Made in any variety of sizes and any quantity of boxes—all solid steel. Approximately 60% of total should be $1\frac{1}{2}$ " x 5": 20%, $2\frac{1}{2}$ " x 5": 15%, 5" x 5": 5%, 5" x 10" or larger. Standard depth outside is 24". Usual width of "stack" or "nest" is $32\frac{5}{8}$ " (6 boxes in a row). Height anything up to 8' 0". We submit designs for any given space.

GRILLE PARTITIONS.

(Not light counter caging)—For guarding the approaches to good bank vaults, or for day gates hinged to vault doors, or for window guards. We make grille sections usually of $\frac{3}{4}$ " rounds spaced vertically on 3" centres with $1\frac{3}{4}$ " x $\frac{5}{8}$ " framing bars, either painted or polished steel finish. Designs submitted.

SAFES.

We make FIREPROOF SAFES 32 sizes—uniform quality, absolutely fireproof.

STEEL CABINETS.—6 sizes, partially fireproof, intended for use in fireproof buildings.

BURGLAR SAFES.—12 sizes, for banks to use inside a fireproof vault.

FIRE AND BURGLAR SAFES.—19 sizes for banks to use where there is no vault in building.

WINDOW SHUTTERS

Made of $\frac{1}{8}$ " or $\frac{1}{4}$ " steel with angle or flat frame anchored or bolted to masonry. Any size or shape.

PRISON CELLS.

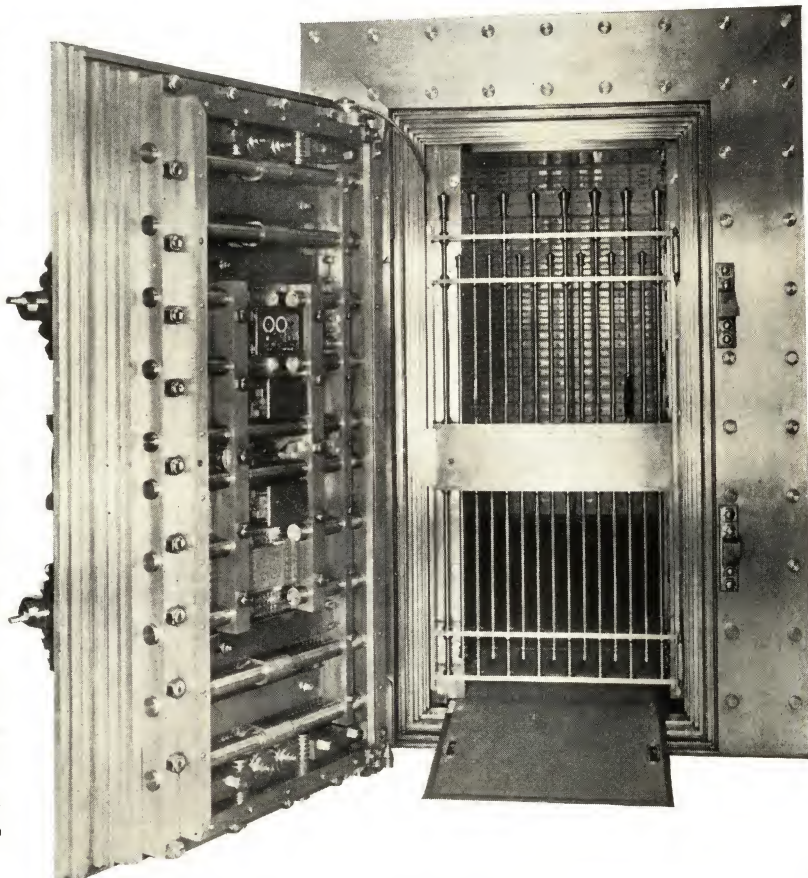
We make units of 1, 2 or 3 cells. The single cell is 4' 6" wide x 7' x 7' the others 9' and 13' 6" wide. Shipped dismantled. Easy to assemble.

VAULT SHELVING.

Made of sheet steel, very substantially. Adjustable and easy to install.

HEAVIEST TYPE OF SECURITY VAULTS.

We design and build the most modern type of heavy vault work for Bank Head Offices, Trust and Insurance Companies, Government Treasuries, etc., and will gladly assist you with detail drawings of such without charge or obligation.



A 12 TON ENTRANCE FOR BANK VAULT.

THE OFFICE SPECIALTY MFG. CO., LIMITED

HOME OFFICE AND FACTORIES:
NEWMARKET, CANADA.

TWELVE FILING EQUIPMENT STORES:
TORONTO (2), MONTREAL, OTTAWA, QUEBEC, HALIFAX, HAMILTON, WINNIPEG,
REGINA, EDMONTON, CALGARY, VANCOUVER

PRODUCTS

FILING CABINETS IN STEEL AND WOOD FOR EVERY PURPOSE; "FIRE-WALL" RECORD SAFES; FILING SYSTEMS FOR EVERY SERVICE; EFFICIENCY DESKS, STENOGRAPHERS' DESKS, OFFICE CHAIRS—TILTER AND REGULAR STYLES; "FIVE-S" STEEL SHELVING; VAULT EQUIPMENT; OFFICE AND VAULT TRUCKS; BOOKCASES; OFFICE AND BOARD ROOM TABLES; POST OFFICE EQUIPMENTS.



"FIRE-WALL" STEEL VERTICALS

With the modern business executive, maximum protection for his records is, in most cases, the deciding factor in the purchase of filing equipment for his valuable business papers. The only type of filing cabinets that gives any kind of worth-while resistance to heat, and consequent protection to their contents, is the "Office Specialty" "Fire-Wall" Steel Verticals, illustrated above.

These cabinets are built with double walls of steel and are insulated with corrugated asbestos and a large dead-air space. Each drawer is equipped with a Safety Latch which automatically locks the drawer when closed and prevents accidental opening in case cabinet tips forward in a fire. "Fire-Wall" Verticals may be obtained for filing bill, letter and cap-size papers, also a Storage Cupboard.



SINGLE DRAWER STEEL UNITS.

There are many uses in every office for one or more of these convenient Single Drawer Steel Units, illustrated below. For the private papers of either clerk or executive, they are particularly serviceable. In the smaller office one of these Units, which holds about 6,000 papers, may afford sufficient filing space to meet immediate requirements.

Professional men and retail merchants will also find these Units adaptable for their filing needs. Units may be stacked on top of each other and bolted together. Bases should always be used.



SECTIONAL FILES Horizontal Construction In WOOD and STEEL.

"Office Specialty" Horizontal Sections are designed for filing every kind of standard business record. Being of sectional construction, units for holding different kinds of file records may be combined in one stack, which thus economizes space. Another economy feature of this sectional construction is, that only sufficient filing equipment to take care of present requirements need be purchased, as additional sections may be added as the need arises. A stack should not be built up higher than six feet to ensure easy reference. (See left centre illustration.)

All "Office Specialty" Horizontal Sections are specially constructed so as to intermember rigidly. All sections are 33 inches wide and either 17 or 25 inches deep. Both depths may be combined in the same stack.

The standardized stock line of "Office Specialty"

Wood Horizontal Sections is finished in quartered oak of a golden shade and hand-rubbed to a beautiful lustrous polish. The Steel Horizontals have a highly polished, baked-enamel finish in a soft Corona green, an appropriately neutral color which harmonizes with any scheme of office equipment. Trimmings for both Wood and Steel lines are brush brass. Mahogany finish in both lines is supplied to order.



DRY INSULATED SAFE WITH UNDERWRITERS' "B" LABEL

The "Office Specialty" Underwriters' "B" Label Safe affords permanent certified protection for business records against fire, water or theft. Its "B" Label means it has successfully passed exacting tests of the Underwriters' Laboratories, and its dry insulation means it will never deteriorate but retain its protective qualities for all time.

"FIRE WALL" RECORD SAFE

This safe is built on the same principle as "Fire Wall" Verticals. Heavier steel is used, however, also more asbestos and an exceptionally large dead-air chamber. You can rely on the safety of records which are housed in an "Office Specialty" Record Safe. The Safe is built in two sizes: larger 40 1/2" wide and the smaller one 20 1/2" wide, both safes 70 1/2" high and 25 1/2" deep.

"800" WOOD VERTICALS.

The "Office Specialty" "800" Verticals, illustrated above on the right, represent the highest achievement of the cabinet-maker's art. They are a "de Luxe" line of filing cabinets. Neither thought nor expense has been spared in order to make them add to the dignity and atmosphere of the modern business office. The simplicity of their straight-line design and the beauty of their lustrous golden finish, immediately attract the eye of the executive.

In service these "800" Verticals offer the maximum. Fully loaded drawers coast in and out with the slightest pressure. Panelled ends are removable. Ends should always be used. One pair is sufficient for a single section or a battery. Sections for filing bill, letter and cap-size papers are obtainable, also storage section.

"Office Specialty" Counter Height Verticals are identical in construction with the "800's" except in height. As their name implies, they are only counter height. Three other lines of standard height verticals are also manufactured by "Office Specialty."

EFFICIENCY DESK.

Until you've actually worked with an "Office Specialty" Efficiency Desk, illustrated below, it's difficult to appreciate the extent to which it helps you through the multitudinous details of the average executive's business day.

The purposeful arrangement of its drawers gives its user a great measure of independence, because he can have his important business data at his finger tips without encumbering himself with detail.



QUALITY.

ADVANTAGES.

INFORMATION.

The unquestioned superiority in construction of all "Office Specialty" Equipment is the natural result of our 38 years of manufacturing experience. The "Office Specialty" absolute guarantee stands back of every piece of equipment.

"Office Specialty" offers you Filing Cabinets and Desks and Chairs for every purpose—Filing Systems for every service. Whatever your needs "Office Specialty" can fill them, whether it be office equipment or a filing system devised to suit your particular business.

Catalogs and descriptive matter illustrating different "Office Specialty" products will be gladly sent upon request made on your business letterhead. Kindly specify the kind of equipment or system you are interested in when writing. Catalog No. 1975 covers Filing Cabinets and General Equipment. Catalog No. 1925 illustrates our complete line of Desks and Chairs. Catalog No. 1850 covers Filing Systems and Supplies.

THE OFFICE SPECIALTY MFG. CO., LIMITED

HOME OFFICE AND FACTORIES:
NEWMARKET, CANADA.

TWELVE FILING EQUIPMENT STORES:

TORONTO (2), MONTREAL, OTTAWA, QUEBEC, HALIFAX, HAMILTON, WINNIPEG,
REGINA, EDMONTON, CALGARY, VANCOUVER.

PRODUCTS.

STEEL OFFICE AND VAULT EQUIPMENTS, INCLUDING "FIVE-S" STEEL SHELVING; SECTIONAL STEEL FILING CABINETS; ROLLER SHELF AND STORAGE SECTIONS; SPECIAL STEEL EQUIPMENT.



The protection and filing of judiciary records is of primary importance to the welfare of the country. The illustration to the left shows part of the large installation of "Office Specialty" Steel Horizontal Filing Sections in the vault of Osgoode Hall, Toronto.



Many priceless records chronicling the events of Canadian history are among the valuable papers in the vault of the University of Toronto. The illustration above shows a corner of the vault, the whole of which is completely equipped with "Office Specialty" Steel Shelving and Filing Equipment.

A stack of "Office Specialty" "Five-S" Steel Shelving used for keeping stationery supplies. Note filing sections inserted to keep record of supplies. "Five-S" Shelving is supplied in two widths—33½" and 17½". Uprights are 6, 7 or 8 feet high. Shelving may be used with or without closed backs, as desired.



"FIVE-S" STEEL SHELVING.

"Office Specialty" "Five-S" Steel Shelving embodies five outstanding utility features—System, Storage, Sectional, Steel, Shelving. Hence its name—"Five-S". It affords you all the advantages of a high-grade sanitary steel shelving and in addition, its exclusive system feature increases its utility. "Five-S" Shelving is specially designed so that any 17-inch "Office Specialty" Horizontal or Half Sections may be fitted into any part of the shelving stack.

When installing vault equipment, "Five-S" Steel Shelving frequently meets every requirement and eliminates the need of specially built shelving. Being of sectional construction, "Five-S" Shelving may be erected to fit almost any desired space.

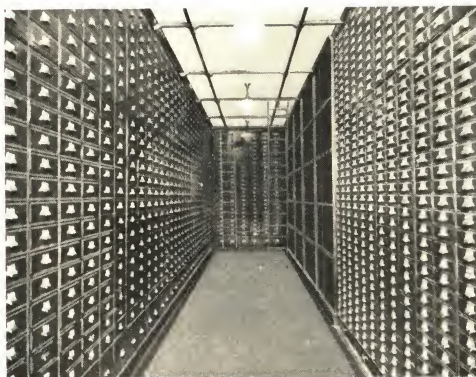
"Five-S" Steel Shelving is also largely used in the stock room. It keeps the stock neat and orderly and its system feature makes possible an accurate and easily accessible stock record.

STEEL VAULT EQUIPMENT.

To ensure permanent satisfaction from your vault filing equipment, we would suggest that you have the installation planned by "Office Specialty" Planning Service Experts.

Wherever analysis shows it possible we adapt standard "Office Specialty" Filing Sections to the needs of our clients. This is always advisable in the interest of economy. Whenever necessary, however, specially designed and constructed equipment, to suit the interior dimensions of the vault and the needs of our client, is specified. Such orders are promptly executed.

Complete vault equipments are installed by "Office Specialty" including sections for filing all kinds of business records, shelving, deposit boxes, storage cupboards, roller book shelves, sliding doors, roller curtains, running ladders, vault trucks, etc.



The illustration on the left shows a portion of the vault of the Royal Trust Co., Montreal. Note the countless sections of "Office Specialty" Steel Horizontals which house the records of this institution.

To the right is a corner of the vault of the Yorkshire Guaranty & Security Corp., Vancouver. Thousands of irreplaceable documents are filed here.



PLANNING SERVICE. The "Office Specialty" Planning Service is freely offered to our customers, present or prospective. Its work is founded on actual experience extending over a period of 38 years. Its plans are based on permanency, yet allow free scope for natural expansions.

INFORMATION. The "Office Specialty" Stock Line of Filing Sections in Steel and Wood and Office Devices is illustrated in Catalog No. 1975. Vault Filing Equipment Installations are described in the "Steel Filing Equipment" booklet. "The Proper Care of Your Stock" and "Watching Your Stock" are two interesting booklets dealing with the use of "Five-S" Steel Shelving for stock-room storage and accurate stock record systems. Ask us to send you copies.

GEO. W. REED & CO., LIMITED

37 ST. ANTOINE STREET,
MONTREAL, QUE.

PRODUCTS.

Manufacturers of "ALMETL" FIRE DOORS and SHUTTERS; "ANCHOR BAR" SKYLIGHTS; "BURT," "STANDARD ROTABLE" and other VENTILATORS; BOIS INTERLOCKING STEEL STAIRS.

SERVICE.

For the benefit of Architects, Engineers and Clients, we maintain a competent engineering staff, whose services are always at their disposal, gratis.

ALMETL FIRE DOORS AND SHUTTERS.

As well as making Tin Clad fire doors, we have obtained the sole Canadian manufacturing rights for Evans "Almetl" Fire Door and Shutters.

These Fire Doors and Shutters are designed on advanced scientific principles and are built of heavy corrugated steel, galvanized. The steel sheets are laid transversely, and are interlined with asbestos roll board. Ample provision is made for contraction and expansion without distortion to the frame.

Excess air space, combined with asbestos roll board, adds greatly to the non-conductivity of the "Almetl."

The frames are $\frac{3}{16}$ " or $\frac{1}{4}$ " x $2\frac{1}{2}$ " bar steel, reinforced on all edges by an extra heavy binder of galvanized steel, which forms a box for the panel and prevents damage to the door or shutter.

Evans "Almetl" Fire Doors and Shutters weigh much less per square foot than wood core metal-clad doors; the average being five pounds per square foot.

All hardware used is of the most modern type and has been approved by the Underwriters.

Evans "Almetl" Fire Doors and Shutters are built under the supervision of the Underwriters' Laboratories, and bear their label.

ROOFING.

Seventy years of experience lies behind our reputation as builders of good roofs of all types.

We will be glad to furnish estimates and collaborate in every way possible.

ANCHOR BAR SKYLIGHTS.

The "Anchor Bar" Cold Rolled Steel Skylight was designed to meet an ever-increasing demand for a skylight which would be rigid, efficient and indestructible. The bar proper consists of two structural members, a 2" x $1\frac{1}{2}$ " tee and $1\frac{1}{2}$ " x $1\frac{1}{2}$ " angle, which are fastened together with forged steel clamps at sufficient intervals to insure great strength and rigidity.

Especial attention is called to method of securing skylights to curbs. This feature gives exceptional strength. The thrust of the skylight is directly against the heavy angle, which in turn is lag screwed to curb and cannot give way unless the curb breaks. The glass rests on flange of tee on a heavy bed of wool felt, rendering it impervious to vibration.

Joints are made tight by cold rolled copper or galvanized iron caps secured by means of brass bolts to non-corrosive metal saddles which are spaced on the bar at about three-foot centres.

Condensation is caught in angle of frame and carried to roof gutter by special channel. The many exclusive features of the "Anchor Bar" Skylight will commend it to all up-to-date designers and owners.

INTERLOCKING SHEET STEEL STAIR FORMS.

We are manufacturers of the "Bois" Patent Interlocking Sheet Steel Stair Forms, the most scientifically designed metal stair on the market. Owing to their interlocking feature which eliminates the iron angle supports necessary in other types of metal stairs, the "Bois" is more rigid and cheaper to erect. Suitable for any type of finished tread such as asphalt, cement, slate or marble.

VENTILATORS.

We are the sole licensed Canadian manufacturers of the celebrated "Burt" Ventilators. These ventilators are made in five distinct types, both forced and natural draft, in sizes to suit every possible condition.

FLOORING.

We specialize in flooring for public institutions, mills, factories, etc.

Reed's Rock Mastic Asphalt Floors are elastic, noiseless, tough, durable, non-absorbent, acid-resisting, sanitary, vermin-, water- and dust-proof. They present an absolutely smooth surface without joints or seams and afford an unusually sure foothold; will not crack from contraction, expansion or settling of building.

Vulcanite Flooring.—Suitable for basements which are usually damp and cold. Vulcanite is laid as an under flooring, upon which either cement or wood finish can be laid, or can be laid as a finished floor. Vulcanite Flooring is an absolute insulator and will positively prevent dampness and vermin.

Mill Flooring (laid directly on ground)—This flooring prevents rot and dampness and gives a strong, solid foundation for machinery, etc.

STRIP FILLING.

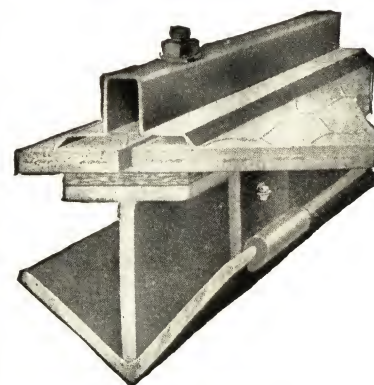
Where strip filling is done with cinder concrete on top of reinforced concrete slab, the cinder concrete has a tendency to draw the latent moisture from the stone concrete, which in turn causes the wood flooring to swell and buckle. Reed's Strip Filling will overcome this trouble as it is impervious to dampness.

INFORMATION.

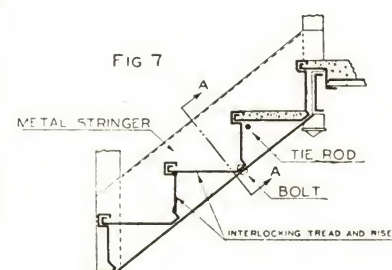
Detailed information in respect to any of the above items will be gladly forwarded on request.



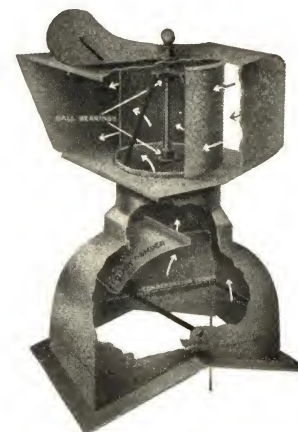
EVAN'S ALMETL" DOOR.



SECTION OF BAR.



SECTION OF METAL STAIRS



BURT BALL-BEARING REVOLVING VENTILATOR.

THE PELLE COMPANY

MANUFACTURERS OF ELEVATOR AND WAREHOUSE FIRE DOORS.

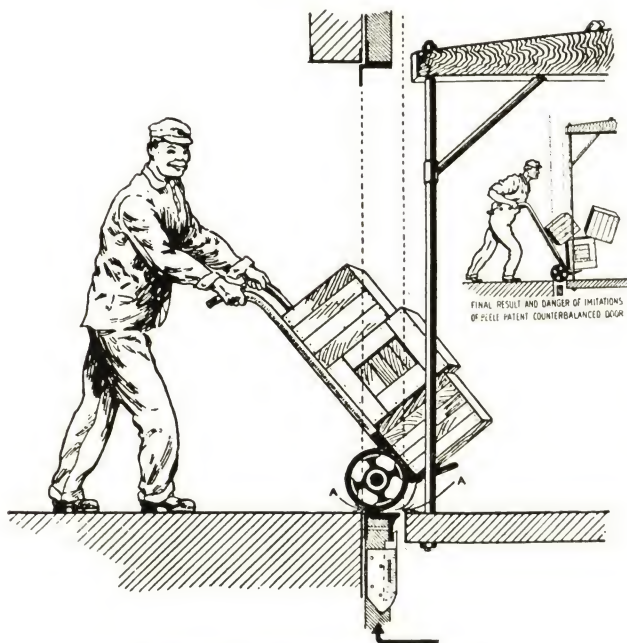
STEWART AND FLUSHING AVENUES,
BROOKLYN, NEW YORK.

FOR AGENT NEAREST YOU, COMMUNICATE WITH MAIN OFFICE.

PRODUCTS.

Approved and labelled by the Underwriters' Laboratories:—

"PEELLE" COUNTERBALANCE TRUCKABLE ELEVATOR FIRE DOORS (PATENTED), "PEELLE" TEL-CO-DOR-PATENTED, "PEELLE" ALL-METAL TRUCKABLE COUNTERBALANCE ELEVATOR DOORS (PATENTED).



"PEELLE" TRUCKABLE ELEVATOR DOOR.

Note special adjustable stop which firmly binds door, when open, to building sill. This is the only counterbalance door that fills gap between car and building floor firmly and perfectly flush with building sill. "Peelle" Corrugated Steel Elevator Door has additional similar binding and supporting at centre or at more frequent intervals according to size of door and amount of trucking it is subjected to. Running chains are not used in the support of "Peelle" Doors when open. The "Peelle" patented truckable feature has been infringed and users should beware of imitations.

STANDARD SPECIFICATIONS.

Openings to the elevator shaft at all floors to be the Peelle Counterbalanced Truckable Fire Door.

The hanger bar at the upper surface of the lower panel is reinforced and extended beyond the panel frame, resting on solid adjustable stops riveted to the guide rails so that all weight is removed from the turnbuckles and chains when door is open. This permits the continuous trucking upon the sill thus formed, which can be made to sustain any specified load.

The doors are made of two thicknesses white pine covered with best grade I.C.terne tin, set and bolted into angle iron frames with reinforced corners, hung on $\frac{1}{2}$ " turnbuckle rods and No. 5 Morton steel chain running over $4\frac{1}{2}$ " double race ball-bearing pulleys. The doors operate on the inside of the hatch with anti-friction guide shoes working in substantial steel guides.

A FEW CANADIAN INSTALLATIONS.

INSTALLATIONS.

CANADIAN PACIFIC RAILWAY, Windsor Station, Montreal, Que.

MCCORMACK MFG. Co., London, Ont.

AMERICAN CAN Co., LTD., Vancouver, B.C. Hamilton, Ont. and Niagara Falls Ont.

LAKE LOUISE CHALET, Alberta.

CANADIAN PACIFIC RAILWAY, NORTH TORONTO STATION.

HEINZ MFG. Co., Leamington, Ontario.

T. EATON Co., LTD., Winnipeg, Man.

MOUNT ROYAL HOTEL, Montreal. Que.

BARRETT MFG. Co., LTD., Montreal, Que.

ARMOUR & Co., Hamilton, Ont.

IMPERIAL TOBACCO Co. LTD., Leamington, Ont. and Montreal, Que.

JERGENS SOAP Co., Perth, Ont.

HOLEPROOF HOSIERY, Co., LTD., London, Ont.

JULIAS KAYSER, Co., LTD., Sherbrooke, Que.

WM. NEILSON, Co., LTD., Toronto, Ont.

J. R. WATKINS, Co., Winnipeg, Man.



TYPE R-6 WOOD TIN-CLAD DOORS FROM LOFT SIDE.

A few of the "Peelle" Doors installed in the Albermarle Building, showing metal-clad panels. 65 "Peelle" Patented Doors installed in this building.

THE KINNEAR MANUFACTURING COMPANY

MANUFACTURERS OF

STEEL ROLLING DOORS.
STEEL ROLLING SHUTTERS.
WOOD ROLLING DOORS.
WOOD ROLLING PARTITIONS.



STEEL BIFOLD DOORS.
WOOD BIFOLD DOORS.
VERTICAL SLIDING DOORS.
CRANE OPENING DOORS.

FACTORY AND HOME OFFICE:
COLUMBUS, OHIO, U.S.A.

CLASSIFICATION. Kinnear Doors and Shutters are commonly classified under two heads, viz.: Service types and Labeled types.

Service types include all those types of doors used on openings where closure is for service purposes only and where installation of doors does not influence insurance rates. These types are usually non-automatic and can be constructed either for manual or motor operation. These types are available for any type of architecture and for large or small openings.

Kinnear labeled types have been tested and approved by the Underwriters' Laboratories and can be furnished bearing their label for the following types of openings.

- Class A.—Openings in Fire Walls.
- Class B.—Openings in Vertical Shafts.
- Class C.—Openings in Partition Walls.
- Class D.—Openings in Exterior Walls.

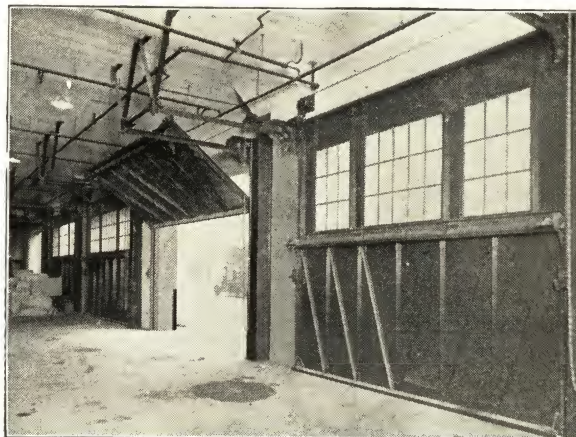
Under this classification we build a comprehensive line of doors, the newer designs carrying improvements covered by patents which are supplied only on Kinnear Doors.

We make a door for every purpose properly designed and manufactured of high class materials by an organization with a quarter of a century of practical experience behind them. Submit your door problems for expert treatment.



ABACUS No. 2

This type is designed and labeled for openings in buildings of joist construction, brackets and mechanism being entirely removed from the possibility of falling timbers in case of fire.



BIFOLD.

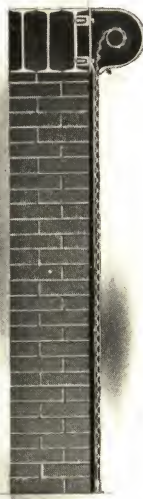
Wood or Steel Bifold doors are designed particularly for buildings where light is a necessity. The upper panel is built to carry large glass area.

Mounted on face of wall, counter-balanced and operated by means of reduction gearing and endless chain. Suitable for warehouses, piers and freight houses.



ABACUS No. 1.

This type is designed and labeled to be mounted on the face of wall. It can be used in fireproof buildings or where the floor above is of fireproof construction.



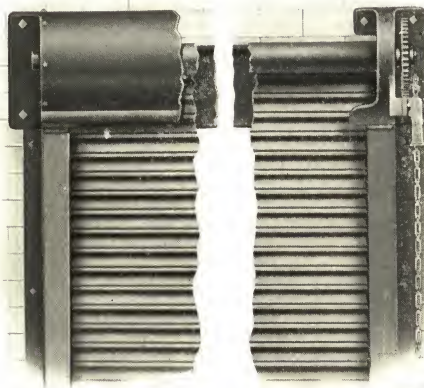
CONSTRUCTION NO. F.M. 10.



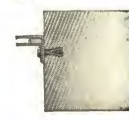
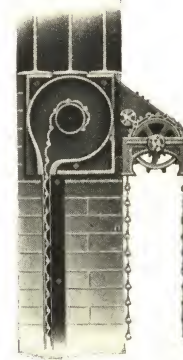
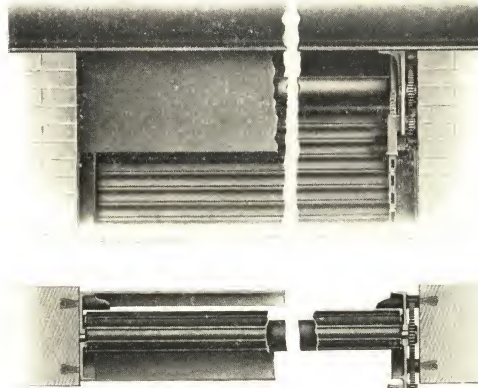
CONSTRUCTION NO. B.M. 10.

Doors overlap the opening at sides and top. Coil and grooves are placed on face of wall. Door is counterbalanced by springs and operated by means of handle in bottom bar.

Grooves and coil are placed between jambs. The door is counterbalanced by springs and operated by means of handle placed in bottom bar. Coil is enclosed in a plain galvanized hood. For special requirements this can be ornamented if desired.



CONSTRUCTION NO. F.H. 20.



CONSTRUCTION NO. B.H. 20.

Grooves and coil are placed on face of wall. Door is counterbalanced by springs and operated by means of endless chain, sprocket and gear. When used as a fire-door it can, if required, be equipped with an automatic closing device. Special designs will be furnished on application.

Coil and grooves are placed between jambs. Door is counterbalanced by springs and operated by endless chain and gear. Coil is enclosed in plain galvanized hood. Modifications of this design can be furnished.

CANADIAN DES MOINES STEEL COMPANY, LIMITED

DESIGNERS, MANUFACTURERS AND ERECTORS OF STRUCTURAL
STEEL AND STEEL PLATE WORK.

OFFICE AND PLANT:

207 INSHES AVENUE, CHATHAM, ONTARIO.
70 ST. JAMES STREET, MONTREAL, QUEBEC.

DES MOINES

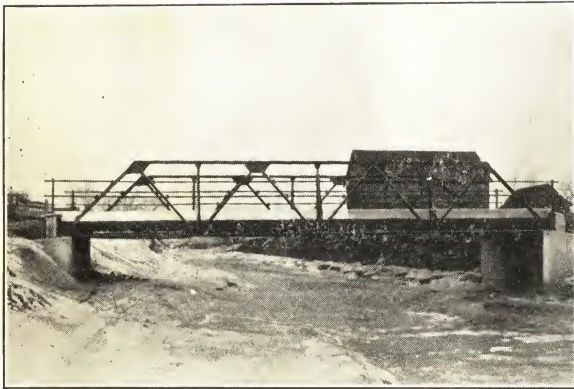
SPECIALTY.

ELEVATED STEEL TANKS and STANDPIPES for Municipal and Industrial Water Supply and Fire Protection, and for Railway Locomotive Service.

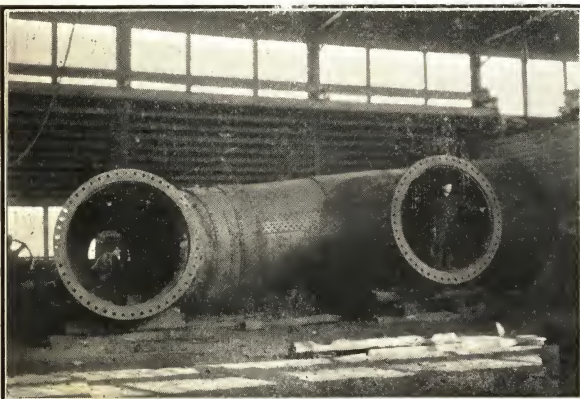
PRODUCTS.

ELEVATED STEEL TANKS, STANDPIPES; and STEEL STORAGE TANKS of all Types and Sizes, for Industrial, Municipal, and Railway Service.

Also AGITATORS; CONDENSERS; COMPLETE OIL REFINERIES; CYLINDRICAL CONTAINERS for Storage, or for High or Low Pressures; STILLs; RIVETED STEEL PIPE; SMOKE STACKS; MILL BUILDINGS and MANUFACTURING PLANTS; STORE, OFFICE, SCHOOL, and CHURCH BUILDINGS; BARGES; BINS; DREDGES; COALING STATIONS; WIRELESS TOWERS; BRIDGES; VIADUCTS; Etc.

DES MOINES HIGHWAY BRIDGE, NEAR TILBURY, ONT. WE HAVE
EXCELLENT FACILITIES FOR THIS CLASS OF WORK.TORONTO, ONT.
YORK TOWNSHIP TANK 200,000 IMPERIAL
GALLONS. 135' TOWER.

INTAKE PIPE LINE, CITY OF OSHAWA, ONT.

PLATE WORK.
HYDRO-ELECTRIC POWER COMMISSION SUPPLY PIPESTRUCTURAL STEEL WORK.
DOWSLY SPRING & AXLE CO., CHATHAM, ONT.

FACILITIES.

Our plant, with but probably one exception, is the most complete and best equipped of any structural steel company in Canada. Large stocks of channels, angles, bars and beams are carried at all times.

SERVICE.

We maintain an Engineering Department to study your requirements and to assist without obligating you. We but ask the privilege of preparing designs and estimates on your requirements—and we give you the benefit of many years of concentrated effort and experience.

Further, we maintain a permanent erection organization of experienced men, who have erected Des Moines products in every section of the Dominion.

LITERATURE.

Printed matter, and any information you may desire, sent upon request.

HORTON STEEL WORKS, LIMITED

FORMERLY

CANADIAN CHICAGO BRIDGE & IRON CO., LIMITED

MAIN OFFICE AND WORKS, 134 JANET ST., BRIDGEBURG, ONTARIO

EASTERN OFFICE, 1009 BANK OF TORONTO BLDG., MONTREAL

PRODUCTS.

STEEL TANKS AND STEEL PLATE CONSTRUCTION are general terms which include the numerous products we fabricate at our plant in Bridgeburg, Ontario, and erect all over the Dominion. Horton steel tanks specifically include Horton elevated steel water tanks for sprinkler, mill, railroad

and municipal services; steel standpipes and reservoirs; flat bottom storage tanks for oil, molasses, acid, tar products, pulp, and all other liquids; gas holders and other gas-tight fluid containers; and special steel tanks, such as cylindrical oil tanks, elevated acid tanks, chip tanks, rectangular tanks, and so on.

Horton steel plate construction includes almost every type of steel structure built principally of steel plates, such as smoke stacks, penstocks, riveted pipes, coaling stations, plate girders, agitators and other refinery equipment, etc., etc.

SERVICE.

We gladly mail our illustrated catalog to those requesting it, and furnish plans, specifications and estimates on any of our products without obligating the inquirer.

Ask for catalog 11.



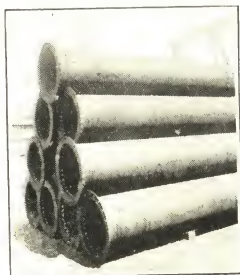
MUNICIPAL STANDPIPES

We design, fabricate and erect in all practical sizes. Standard sizes, 10,000 to 2,000,000 U.S. gallons. We can build such tanks successfully in much larger sizes. The superiority of steel for such structures is unquestioned. Steel standpipes and reservoirs can be made absolutely watertight in the first place, and the elasticity of steel prevents leaks from starting later as a result of the settlement of foundations.



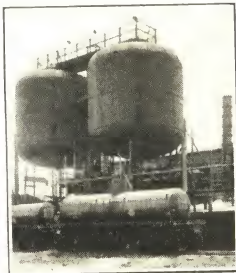
HORTON DIGESTERS

Horton sulphite pulp digesters are built either to our designs or our customers'. They are built with adequate factors of safety to withstand steam pressure and stresses caused by alternate filling and emptying and differences in temperature. The picture shows a Horton digester assembled in the shop before shipment to insure accurate fitting in the field. Our special leaflet on digester design will be sent on request.



RIVETED PIPES

These 24-inch steel pipes were made for Scarborough, Ontario. We make all the larger sizes of riveted steel pipes in varying lengths and tested to any pressure.



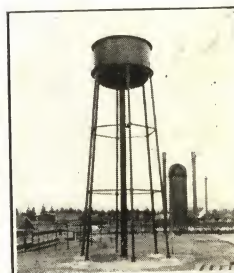
ACID TANKS

These elevated acid tanks with elliptical bottoms and roofs permit discharge by gravity. 19 standard sizes up to 500,000 U.S. gallons. We also build flat-bottom acid tanks.



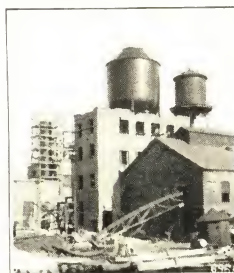
GAS HOLDERS

We are specially well equipped to fabricate and erect gas holders. We shall be glad to submit designs, specifications and prices at any time, or to quote on designs furnished us.



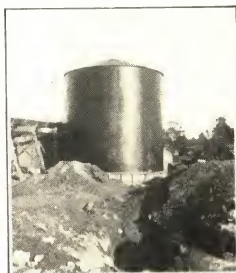
SPRINKLER TANKS

The Horton tanks were the original steel sprinkler tanks with self-supporting bottoms. Picture shows elliptical-bottom type protecting lumber mill. Horton tanks endure.



CHIP TANK

This picture illustrates a Horton chip tank, one of our special products for the pulp and paper industry. We design and build many kinds of special containers for almost every kind of liquid.



PULP TANKS

Pulp or "stock" tanks for the pulp and paper industry are available in all sizes. We design special tanks for various purposes for all industries and conditions, with wooden or steel roofs.



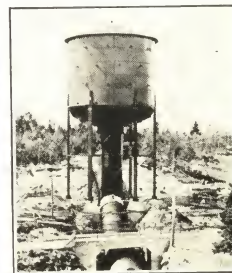
HORTON ELEVATED TANKS

This is the type invented by HORACE E. HORTON in 1891. We have built thousands for municipal, sprinkler and mill service. Standard capacities up to 1,000,000 gallons;



HORTON RAILWAY TANKS

Conical-bottom and also elliptical-bottom water tanks available in many standard capacities. The picture shows our "Canadian Special" type with self-contained heating unit.



SURGE TANKS

The picture shows a 280,000-gallon differential surge tank built for the Nova Scotia Power Commission. We build surge tanks of all types and sizes, as well as penstocks, etc.



OIL TANKS

These oil tanks were built for the Barrett Company, Ltd., in Montreal. We also build cylindrical tanks, large field storage tanks and refinery equipment, of many kinds, including the 5RING55.

DOMINION MESSENGER & SIGNAL CO. LIMITED

MONTREAL

OTTAWA

TORONTO

HAMILTON

WINNIPEG

GEO. D. PERRY, President.

HEAD OFFICE, TORONTO, ONT.

S. B. McMICHAEL, General Manager.

DOMINION ELECTRIC PROTECTIVE SIGNALING SYSTEMS.

WATCHMAN CLOCK AND MANUAL FIRE ALARM SYSTEM



Checks the movements of night watchmen and provides a special private fire alarm service. Connects with central station and fire department headquarters. System is designed for protection of office buildings, hotels, hospitals, schools, factories and warehouses.

The Watchman Tour System, similar in many ways but somewhat less expensive, can be installed when ordinarily a watchman clock would be used and when every watchman station need not be a fire alarm signaling box.

SPRINKLER SUPERVISORY SYSTEM.



For connection with automatic sprinkler systems of any kind or size, and generally used in place of watchman service. Accepted in lieu of a watchman by the leading Fire Underwriters' Association. Of particular value in factories and warehouses containing machinery and stock of high value. Saves the subscriber from \$500 to \$800 per year as compared with watchman service. Connects with central station and fire department headquarters.

BURGLAR ALARM SYSTEM.



For preventing burglary of safes, vaults and stores. Used in place of a watchman service in banks and other financial institutions, as well as in silk, jewellery, fur and other stores carrying merchandise stock of high value.

The "Phonetalarm", a development of recent months, is employed in the protection of money and security vaults, obviating the use of highly expensive vault linings. The "Phonetalarm" fills an urgent need, and combined with the use of bolt contact devices offers a form of electric protection that is the acme of security.

AUTOMATIC AND LOCAL FIRE ALARM SYSTEMS.



Automatic system transmits alarms of fire to central station and fire department headquarters. Takes the place of a watchman service. Local or building alarm system that is of the utmost importance as a time-saver and of inestimable value in a large and well organized plant.



1. OGILVY BUILDING, Toronto. 2. CAN. STEEL FOUNDRIES LTD. Montreal.
3. BANK OF MONTREAL, Winnipeg. 4. HOWELL LITHO, CO. LTD. Hamilton.
5. UNION BANK, Winnipeg.

SEND FOR THIS BOOK.

All of the details of our standard Electric Protective Signaling Systems together with over sixty illustrations, are given in our book entitled "Signaling Systems." If you have not a copy on file please send for one. A card to the manager of any of our offices will be sufficient.



REPRESENTATIVE FIRMS USING DOMINION PROTECTIVE SYSTEMS

Ames, Holden & McCrea ly	Montreal
Bank of Montreal	Montreal
Canadian Vickers, Ltd.	Montreal
Goo. J. Wines, Limited	Montreal
Mappin & Webb Canada, Ltd.	Montreal
Ogilvie Flour Mills, Ltd.	Montreal
St. Lawrence Sugar Refineries	Montreal
Sun Life Assurance Co. of Canada	Montreal
Windsor Hotel Co.	Montreal
Bank of Nova Scotia	Ottawa
American Bank Note Co.	Ottawa
Bryson-Graham, Limited	Ottawa
Gilmour & Hughson, Ltd.	Ottawa
Ottawa Car Co.	Ottawa
Adams Furniture Co. Ltd.	Toronto
Canada Permanent Trust Co.	Toronto
Canadian General Electric Co.	Toronto
Harris Abattoir, Limited	Toronto
Holt, Renfrew & Co.	Toronto
Hospital for Sick Children	Toronto
Imperial Bank of Canada	Toronto
Loew's Theatre	Toronto

John Macdonald & Co.	Toronto
Ryrie Bros. Limited	Toronto
Silks, Limited	Toronto
Toronto General Hospital	Toronto
Willards Chocolates, Limited	Toronto
Wm. Wrigley, Jr.	Toronto
Bank of Hamilton	Hamilton
Hamilton City Hospital	Hamilton
Herald Printing Co. Limited	Hamilton
Howell Lithographic Co. Limited	Hamilton
Procter & Gamble	Hamilton
Right House	Hamilton
Henry Birks & Sons, Limited	Winnipeg
Dominion Bank	Winnipeg
Canadian Pacific Railway Co.	Winnipeg
Manitoba Government Telephones	Winnipeg
Osler, Hammond & Nanton	Winnipeg
Pilkington Bros. Limited	Winnipeg
Swift Canadian Co. Limited	Winnipeg
R. J. Whitla & Co. Limited	Winnipeg
J. C. Wilson Paper Co.	Winnipeg
Woods Mfg. Co. Limited	Winnipeg

